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CONTENTS

Editorial:

Corrosive Materials for the Household 347

Original Articles:

Further Study of the Tannin of Geranium Maculatum. By Josiah C. and Bertha L. DeG Peacock, Philadelphia, Pa. 349

Eutectic. By David Wilbur Horn, Bryn Mawr, Pa. 357

The Pharmacist in Relation to the Public Health. By Hugh S. Cumming, Surgeon General, U. S. Public Health Service, Washington, D. C. 361

The Sixth Annual Plant Science Seminar 369

Address of the Chairman, Heber W. Youngken 370

Report of Committee on Drug Market, Pennsylvania Pharmaceutical Association 377

The Historian's Report. By E. G. Eberle, Baltimore, Md. 379

Scientific and Technical Abstracts:

Abstracts of Scientific Papers Presented Before the 1928 Meeting of the American Pharmaceutical Association 385

Medical and Pharmaceutical Notes 400

News Items and Personal Notes 402

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THE AMERICAN
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VOL. 100 SEPTEMBER, 1928 NO. 9

EDITORIAL

CORROSIVE MATERIALS FOR THE HOUSEHOLD

AFTER much agitation, laws have been made controlling the sale of caustic alkalies and other corrosive and poisonous preparations which have of recent years been extensively used in ordinary housekeeping, especially in the kitchen and laundry. These laws require distinct, correct labeling and the statement of a suitable antidote. As with all other laws, it has as yet been impossible to so control the distribution and sale of the products as to prevent false claims for strength, purity or harmlessness. If the price of liberty is eternal vigilance, the price of restriction is eternal analysis and investigation.

In the current issue (August) of the excellent bulletin (Health) published by the New Hampshire State Board of Health, the results of a comprehensive investigation into the composition and labeling of the ammonia and chlorinated preparations sold for domestic purposes in that State are set forth. The data may be considered to represent about the conditions of affairs in most other parts of the United States. Under the New Hampshire law of 1925 household ammonia must contain not less than 8 per cent. of ammonia (presumably calculated as NH_3), must bear a poison label and a statement of the antidote. The label must not bear any false or misleading claim. Thirty-one samples were examined; seventeen were in some way in disregard of the law. Such unwarranted claims as "extra strong," "concentrated," "high test," still persist. One company (manufacturing in another State) objected to the view of the New Hampshire health authorities that such phrases as "soft like rainwater to the skin," "as harmless to the skin as fine soap," were misleading, but was properly informed that such designations would not be permitted on labels of the containers sold in New Hampshire.

Preparations containing free chlorine or its effective equivalent hypochlorites are also now under legal control. A minimum content of 2.25 per cent. of active chlorine is the limit. Of forty-six samples tested, twenty-five failed to reach standard. One sample was above the standard, but was illegal because it claimed a much higher percentage than was available. The samples collected ranged from no appreciable free chlorine content to 4.62 per cent. The samples that were in accordance with the law were in most cases well above the minimum.

All the data collected in the investigations of materials furnished in packages, nowadays so largely used by housekeepers, show that very large amounts of inferior products are being offered, and that enormous profits are being made by large manufacturing concerns and large scale distributors. It was noted, for instance, that one of the samples of household ammonia that fell below the requirement (containing 6.77 per cent. instead of 8 per cent.) was furnished by one of the largest chain-store systems in the country. It would be entirely possible for such a firm to secure a properly manufactured material and market it at a reasonable profit.

The report from which these data are taken gives the names of all the manufacturers of the several samples.

HENRY LEFFMANN.

ORIGINAL ARTICLES

FURTHER STUDY OF THE TANNIN OF GERANIUM MACULATUM *

By Josiah C. and Bertha L. DeG. Peacock

IN THE American Journal of Pharmacy for July, 1891, one of us (J. C. P.) in collaboration with Henry Trimble published an article on Geranium maculatum.

That reference pertained to collections of the rhizome which were made between May 1, 1889, and May 13, 1891, for the purposes of determining the tannin content at different seasons of the year, and of learning something of the nature of the tannin itself.

*Presented to the 1928 Meeting of the Pennsylvania Pharmaceutical Association.

Shortly after that work was done, as stated in a paper on the tannin of Heuchera americana that were presented to this Association last year, certain improvements in methods of isolation and purification of tannins were adopted, and since that time it has been thought desirable to study Geranium by these improved methods. The better insight to the nature of the tannin of Heuchera americana that was gotten by these methods, as reported last year, has led to this further study of the tannin of Geranium maculatum.

The work here reported on Geranium is along the same lines as that presented last year on Heuchera, and the results will be found to revise certain conclusions which were drawn in 1891.

Quoting from the paper of 1891, Trimble and Peacock sought to extract the tannin and purify it:

> "To obtain this principle, a quantity of the dried and finely ground drug was percolated with ether, specific gravity, 0.750, the solvent distilled, the extracted matter treated with water, filtered, and the tannin preciptated from the filtrate with lead acetate. This precipitate was rapidly washed, decomposed by hydrogen sulphide in the presence of water (filtered) and concentrated by distillation under reduced pressure.
>
> "The concentrated solution was agitated with stronger ether, which was subsequently separated and the distillation of the aqueous solution continued, under the above conditions to dryness, a red-brown, somewhat porous mass being obtained. The ether removed considerable gallic acid."
>
> "This tannin was not completely soluble in cold water but was readily soluble in hot water. Weak solutions remained permanent for a reasonable time, but a 1% solution rapidly deposited a red-brown precipitate. . . ."

After this deposition had taken place the resulting clear solution was reddish in color, and gave reactions with the salts of iron, lead, copper, and other metals which closely resembled those produced by the same reagents on gallotannic acid.

In that work, as the tannin of Geranium maculatum gives like gallotannic acid a blue color and precipitate with ferric salts, both the freshly collected rhizome and this same material after it had been air-dried were examined for gallic acid. This was done by shaking a strong decoction of the fresh drug with stronger ether, or macerating the ground dry rhizome with that solvent, separating solvent, evaporating, dissolving residue in water, filtering clear and testing with ferric chloride. Residues composed of acicular crystals that gave blue colorations were regarded as indicating gallic acid.

That but little evidence of gallic acid was then obtained will be noted by the following quotation from the paper of 1891.

> "Every one of the fourteen lots gathered was tested for gallic acid by agitating the decoction with ether, allowing the separated ether to evaporate, and testing the residue."
>
> "Negative results were gotten in nearly every case, and where they were not, the evidence was only that of mere traces. Gallic acid does not exist in the plant, but is easily found in the rhizome after drying, resulting from the easily decomposable tannin. Direct extraction of the fresh rhizome also failed to show the presence of gallic acid."

To summarize the conclusions of 1891, the impression then conveyed was that Geranium maculatum contains a tannin that with metallic compounds gives reactions identical with gallotannic acid, but that the tannin of Geranium is a red-brown substance not completely soluble in cold water, although readily soluble in hot water; also, that the tannin is a glucoside which is decomposable into gallic acid, glucose and a phlobaphene, which at the time was called "geranium red."

But in the light of experience to be gathered shortly after this publication, the tannin then obtained was clearly not gallotannic acid, for both its color and its solubility plainly showed it to be a phlobaphene or alteration product of a tannin, in that respect being totally different from gallotannic acid.

As pointed out in last year's paper on Heuchera, it seems reasonable to believe that the primary source of phlobaphene will be found to be a sap-soluble or water-soluble tannin in the living drug and that this principle became changed during the drying process with formation of phlobaphene. To review these matters, on Geranium, it was decided to try the later adopted methods of isolation and purification.

For the purposes of this work, a quantity of the identified drug was bought in the wholesale market and reduced to fine powder. In milling to a No. 80 powder, there was found to be about 5% of the drug material that remained as a coarse residue, and this was kept apart from the material to be used. Another portion of the drug was ground to a No. 30 powder.

Both the No. 80 and No. 30 powders of the drug showed 11.5% of moisture and 8% of ash.

In 1891, estimations of the tannin were made by precipitating with gelatin in presence of alum, weighing the precipitate and calculating tannin therefrom. It was therefore now thought to be of

interest to apply the hide-powder method of assay to this specimen of the drug.

Accordingly, infusions of 10% of the No. 30 powder were prepared with both cold and hot water. The cold infusion was made by repeated stirring during six hours. The hot extraction was had by boiling the powder with water for one hour. Both liquids were filtered; the hot-water one was allowed to cool, whereupon it deposited considerable red substance and was later clarified with the aid of paper pulp.

As in the case of like infusions of Heuchera americana, both of these solutions of Geranium maculatum were brilliant, wine-red (that prepared with hot water had the more color), had odor of the drug, were strongly astringent and showed a strongly acid reaction to litmus. Both possessed a pronounced disposition to froth when shaken.

And, as with Heuchera, both infusions gave abundant flesh-colored precipitates with gelatin solution; blue and blue-black colors and precipitates with ferric chloride (except that in the case of Geranium there is a tendency to shade off into purplish); and heavy pale-buff precipitates with lead acetate. Hydrochloric acid slowly caused precipitation in both liquids. Acetic acid did not precipitate either of the solutions. Both infusions withstood dilution with water without showing precipitation.

The cold-water infusion showed 24.12% of dissolved solids; while the clarified hot-water decoction was found to contain 20.83%.

From the cold-water preparation, hide-powder removed solids which indicated 17.54% of tannin or tanning value; from the hot-water solution 13.16% was removed. All four of these figures refer to the air-dried powder.

Immediately upon contact with hide-powder, the liquids lost their wine-red colors and after maceration during an hour were found to be practically colorless. Also they had given up their astringency and almost all of their taste, as well as two-thirds of their original titratable acidity. Both the original and the hide-treated liquids rapidly decolorized potassium permanganate solution, the original to 15½ times the extent of the hide-treated solution.

When the fluids from these hide treatments were filtered entirely clear, they showed no precipitation with gelatin and but a slight precipitate with lead acetate solution. With ferric chloride there was a greenish coloration, but no blue color to indicate the presence of

gallic acid. A control test, however, showed the conditions were favorable for indication of gallic acid had it been present.

Some of this liquid from the hide-powder treatment was treated again with hide powder, but the second application of this detannating agent made no difference in the behaviors of the clear liquids toward gelatin, lead acetate or ferric chloride. The result is especially interesting as evidence of the absence of gallic acids, which in 1891 was assumed to be present from certain reactions with ferric chloride. But it will be appreciated that the provisions of the presently applied test exclude all tannin while the technique used in 1891 is likely to mechanically include enough tannin to show a blue color with ferric salts and thereby mislead.

From none of the various infusions of the dried drug would acetic ether remove more than proportionately small amounts of the abundant tannin-reacting substance contained in the aqueous liquid, a behavior that showed the liquids to contain relatively more phlobaphene than unchanged tannin. This effect has been found by us to be a definite disposition of phlobaphenes in some phase of their existence. It was therefore necessary to try by other means to obtain tannin that by both its solubility in water and its easy removal from water solution by acetic ether would show itself to be a substance from which the phlobaphene formations originate. The details of the experiments made for this purpose are hereinafter given.

To learn further regarding the behavior of the tannin constituents toward other solvents, as also to note the amounts of extractive removed, a kilo of the dust-like powder was exhausted with chloroform, ether, acetic-ether and acetone, applied in the order named; in each case, the drug being freed of any previously used solvent.

The behaviors and results thus obtained were strikingly similar to those reported a year ago for Heuchera americana.

Chloroform Extract.—The chloroformic percolate was of a pinkish color and upon evaporation left a reddish-amber residue amounting to .47 per cent. of the drug. Of this substance, petroleum ether dissolved an amount equal to .27 per cent. of the drug. The remainder of the chloroform extract was soluble in ether with the exception of an extremely slight residue of phlobaphene substance that was soluble in acetic ether, as was also the portion of this extract which the ether had dissolved. The ether-soluble material, upon evaporation of solvent, was left as a porous, resinous residue. The

petroleum ether extractive was a semi-solid mass of fatty substance possessing a dark amber color. To water, this mass yielded a minute amount of colorless needle-shaped crystals to which the above-mentioned greenish coloration with ferric salts was due. The frothing obtained when the fatty portion was shaken with water, strongly suggested the presence of saponin.

Ether Extract.—Applied after chloroform, ether U. S. P. removed but a trifle of extractive, approximately 0.06 per cent. or about one-eighth of what chloroform had removed. The percolate exhibited but little color until concentrated by distillation for the purpose of recovering the solvent, when it acquired a golden-yellow tint and left a residue very much like that which chloroform had removed from the drug. In color, solubility and other properties, the ether extractive was a counterpart of the chloroformic extract.

Acetic Ether Extract.—Following choloroform and ether, acetic ether of 99 per cent. strength was applied to the drug residue. The percolate was of light amber tint and yielded 0.14 per cent. of a flesh-colored, powdery residue of fat, phlobaphene and tannin. Petroleum ether removed from it a trifling amount of fat; water dissolved a considerable proportion of the remaining solids, and from this solution acetic ether removed some porous straw-colored tannin as confirmed by behavior toward ferric chloride, gelatin and lead acetate. The phlobaphene remaining after water treatment was found to be soluble in both acetic ether and acetone.

As with Heuchera, it is worthy of note that while acetic ether does not extract more than a trace of tannin and phlobaphene from the dried rhizome of Geranium, when these substances have been removed by acetone, they then become soluble in acetic ether, even without prior solution in water.

Acetone Extract.—After extracting the drug with the three solvents so far mentioned, acetone, U. S. P., was applied. From the start of percolation the solvent had a sherry-wine color, but this gradually decreased in intensity until the percolate was very pale amber. By this time but little solids were being removed, as learned by recovering of solvent from the successive lots of percolate. Up to this stage acetone had extracted 5.67 per cent. of solids, which upon addition of water proved to be almost entirely cold-water-soluble tannin and phlobaphene.

To this juncture, about five litres of acetone had been passed through the drug; then the acetone percolate again became reddish and about five litres more of the solvent were required to be passed through before the color was again reduced to light-straw.

The total solids extracted by the second five litres of acetone was approximately one-half of that removed by the first five litres, or 2.88 per cent.

With all portions of the acetone percolate, as soon as heat was applied for recovery of solvent, the originally brilliant-red solution instantly became cloudy, and when the solvent had been completely recovered, the either porous or syrupy residue was difficultly soluble or miscible with cold acetone, in which liquid it had once been so plainly soluble.

The porous tannin which was removed by the first five litres of acetone showed a distinct disposition to darken in color and change texture when heated on the water bath, as though it were gradually changing to phlobaphene; and when, to facilitate the complete expulsion of adhering solvent under reduced pressure and enable the weighing of the extractive, it was dried on a water bath, there was evidence of a progressive alteration of the tannin as marked by a continued condensation of water that evidently came from some change going on in the gradually reddening residue.

The second five litres of percolate had no sooner shown an approach to exhaustion of the drug than a reappearance of color in the percolate again plainly indicated that further alteration of tannin constituents had occurred, as did also a third lot of percolate which removed about as much tannin and phlobaphene as the second lot of the solvent had extracted.

This apparent approach to exhaustion and the strange reversions to an equal amount of removed solids of tannin and phlobaphene character occurred four times before extraction by acetone was nearly approached. Each time the solids removed amounted to about the same quantity for the four lots of about five litres each of solvent. Upon recovery of each lot of solvent under reduced pressure, the extracted matter showed as a porous reddish residue or as a varnish that was difficultly soluble in cold acetone.

The substance obtained from the third, fourth and fifth lots showed an increasing tendency to assume the colloid state of phlobaphene that is met with in the gelatinization of the fluid extract and other preparations of Geranium.

While a somewhat similar behavior was last year reported for Heuchera americana, Geranium maculatum showed this peculiarity to a far more marked degree.

Each lot of the tannin and phlobaphene extractive that was removed by the several successive lots of the acetone was treated with cold water in which every one of them was largely soluble, the resulting solutions, either dark wine-red or amber, were clarified by means of paper pulp, filtered and shaken with acetic ether. This solvent removed small quantities of the dissolved matter and upon recovery left residues of tannin and phlobaphene.

These residues behaved similarly as to solubility in water and reacted alike to ferric chloride, gelatin and lead acetate, and were to all appearances alike. The several lots of them thus obtained were finally combined and purified by repeated solution in water and removal from it by acetic ether until the substance was completely soluble in cold water and removable from it by means of acetic ether.

As elsewhere stated, the phlobaphene portion of the substance was not readily removed from water solution by acetic ether, the latter solvent when applied extracting but a small fractional part of the total color of any highly colored water solution.

When by color and subsequent evaporation the acetic ether layer showed it had reached its limit of effect in removing the less altered tannin from these solutions, the remaining aqueous liquid was saturated with sodium chloride. This addition brought about the separation of bulky light-brown curd-like precipitates, even in the presence of acetic ether. These precipitates were peculiarly bulky and when collected and pressed they were found to have enveloped large quantities of water and acetic ether. These precipitated phlobaphenes were mostly soluble in acetone, although slow to enter solution evidently because of some change that gradually occurs, as indicated by a progressive darkening of color and steady separation of a considerable amount of sodium chloride in finely crystalline form.

While water extraction of the dry drug contains an abundance of astringent matter, proportionately little of it is removed by agitation with acetic ether, a feature which indicates that most of the tannin of the dry drug is in phlobaphene form.

Acting on the belief that these phlobaphenes are formed from a primary sap-soluble tannin, it was decided to anticipate the formation of much of the phlobaphenes by extracting some recently gathered

rhizome and thereby determine if such primary sap-soluble tannin could be isolated.

For this purpose about two and one-half kilos of fresh rhizome were finely chopped and macerated for a day with acetic ether. The mixture of drug and solvent was then strained and the acetic ether layer separated from the sap-moisture layer.

Next the acetic ether was recovered by distillation in vacuo, whereupon it left a porous greenish residue that plainly suggested tannin.

Treatment of this residue with water and filtration gave a reddish amber solution which, upon agitation with acetic ether, separation of solvent and recovery of it, showed as the solvent distilled a snow-white tannin, which upon complete drying in vacuo developed a faint greenish color.

This tannin was further purified by repeated solution in water and shaking out with acetic ether until obtained in the purified state represented by the light-straw sample here exhibited.

While the purified tannin of Geranium closely resembles gallotannic acid in behavior towards solvents, as does also the tannin of Heuchera, again like the last, it differs from gallotannic acid by affording a phlobaphene instead of gallic acid when subjected to the action of mineral acids.

Solutions of Geranium tannin give precipitates of phlobaphene when saturated with sodium chloride.

When aqueous solutions of Geranium tannin are frozen, there is alteration to phlobaphene. This being the case, those portions of the rhizome which remain in the ground over winter to be repeatedly frozen and thawed, may well be expected to contain phlobaphene rather than the original tannin.

If an aqueous solution of Geranium tannin is mixed with an aqueous solution of the crystalline acid of the drug, to which latter principle reference has been made, phlobaphene is gradually produced, indicating that during the process of drying the primary tannin of the drug is gradually altered into the phlobaphene substances found in the dried material.

With regard to the statement made in 1891 to the effect that the tannin of Geranium is a glucoside which is decomposable into gallic acid, glucose and geranium red, the present work, as already pointed out, has demonstrated the absence of gallic acid.

Experience gathered since 1891 shows but little if any likelihood that a tannin which yields phlobaphene will also yield gallic acid as the result of the action of hydrochloric acid.

In 1891, the presence of glucose was inferred from the reduction of Fehling's solution. But experience has also shown that the process then employed to remove copper-reducing effects other than glucose, preparatory to the application of Fehling's solution, cannot be depended upon, for traces of tannin and its alteration products which are likely to remain in solution may reduce Fehling's solution and be wrongly interpreted as glucose.

Several attempts have lately been made to apply Fischer's phenylhydrazine hydrochloride test to the products of decomposition of Geranium tannin resulting from action of strong hydrochloric acid as used in 1891. While the results obtained were not as clear-cut as might be wished for, there was no evidence of the presence of glucose, although check tests to which very minute amounts of glucose were purposely added proved that the condition of the tests were proper for the showing of this sugar had it been present.

Revising the statements made in 1891, it is plain that the tannin of Geranium maculatum is not similar to gallotannic acid, nor does it give either gallic acid or glucose on decomposition by mineral acids. Furthermore, gallic acid is not present in Geranium maculatum and is not formed on the drying of the rhizome. The attribution to gallic acid of the evidences of the slight crystalline residues and their reactions to ferric chloride which were observed in 1891 was wrong, because as elsewhere mentioned all traces of tannin were not excluded by the test methods then employed.

But there is present in Geranium maculatum in both fresh and dry rhizome a crystalline acid substance that gives a greenish color with ferric chloride, and which decomposes the soluble tannin with formation of phlobaphene.

The result of the present work shows conclusively that Geranium maculatum contains a snow-white tannin that is soluble in water (sap-soluble), and that this tannin is the primary source of the various forms of the phlobaphene which are met with in the dried commercial drug and the preparations thereof.

EUTECTIC

By David Wilbur Horn, Ph. D.

IT MAY BE TAKEN for granted that scientific terms are as exact in definition as possible under the circumstances that obtain when they are called into being. It is good practice among scientists to retain a term in its pristine exactness as long as the facts permit. When usage of a scientific term shows inexactness, it is time to give the matter some consideration.

In some pharmaceutical circles the word *eutectic* is being abused by applying it to certain incompatibles. Any attack upon such abuse may be countered by the assertion that "there is authority for it," and in this particular instance this defense is good as far as it goes. The much-used dictionaries, the Merriam-Webster and the Funk & Wagnall Standard, define the word eutectic in a general sense in which it was *not* intended by its English sponsor to be used in scientific circles. The Century Dictionary agrees with these in its major definition, but it recovers the scientific meaning of the term in the fine print that follows this major definition and in its separate definition of the term *eutectic alloy*. By inference a scientifically correct meaning also is given in this dictionary for "eutectic point" and "eutectic temperature."

The historical setting of the English word *eutectic* determines its scientifically correct use. This setting seems to have been respected among physical-chemists, and in none of their works has the writer found the term abused. As an English word, *eutectic* appeared first in 1884.[1] It was introduced by Frederick Guthrie. With incisive clearness Guthrie wrote: "The main argument of the present communication hinges upon the existence of compound bodies, whose chief characteristic is the lowness of their temperatures of fusion. This property of bodies may be called Eutexia, the bodies possessing it eutectic bodies or eutectics (*εὖ τήκειν*). . . . It will, however, perhaps be better to make the term more useful by limiting its application. I shall use it, and I should like it to be used by others, for bodies made up of two or more constituents, which constituents are in such proportion to one another as to give to the resultant compound body a minimum temperature of liquefaction—that is, a lower temperature of liquefaction than that given by any other proportion."

[1] *Philosophical Magazine* (5), XVII, p. 462, 1884.

It must be clear that if the intention of Frederick Guthrie is respected, there is only one definite meaning for the English word *eutectic*. It applies to that compound body having the lowest melting point possible to any compound body of the given constituents. This is the sense in which its originator used it and "should like it to be used by others." It may be urged that Guthrie addressed himself to scientists, and it should be made clear that the present discussion is directed solely to such persons. We had better follow Guthrie and with him "make the term more useful by limiting its application."

There is a Greek adjective εὐτηκτος of similar character which appears in a spurious work known as Aristotle's Problems.[2] The passage refers to certain medical procedures and the adjective is used in the comparative degree, meaning more easily liquefied. Liddell & Scott [3] give only this one reference to the use of this adjective, which may warrant the conclusion that it was not generally used; perhaps it is proper to regard it as a case of unique use. However this may be, Frederick Guthrie knew of a Greek word of related meaning and referred to it [4] in a footnote attached to the word *Eutexia* and reading thus: "Used in very much this sense by Aristotle. . . ." And with this in his mind he nevertheless thought it "better to make the term (eutectic) more useful by limiting its application." Guthrie used the word eutectic not only as a noun, as shown in the passage quoted above, but also as an adjective, in such expressions as "eutectic salt alloys" and "eutectic metallic alloys."

If we turn now to pharmaceutical matters, we note that the list of *pharmaceutic* or *physical incompatibles* includes pairs of solid substances which when brought together melt. Phenol with menthol, phenol with camphor, camphor with chloral hydrate, will serve as examples. There seems to be a tendency in some circles to designate any of these liquid mixtures a *eutectic*. It is clear from Guthrie's statement that this use of the word eutectic could be scientifically correct and justifiable only if the incompatibles had happened to be brought together in that particular proportion that would yield the mixture of lowest melting point.

While it is a well-known fact that pure single solid substances which melt without decomposition exhibit definite single melting

[2] Arist. Prob. I, 50.

[3] *Greek-English Lexicon*, 8th Edition.

[4] Probably εὐτηξία, being easily melted. Arist. Mirab. 50. Liddell & Scott, *loc. cit.*

points or "temperatures of liquefaction" when heated, this is not in general true of mixtures. In mixtures there are many possibilities as to melting point. In the case of any one pair of substances it is usually reasonable to expect at least as many different melting points as there are possible mixtures of these two substances. Among these many mixtures, only the one with the lowest melting point of all is correctly called the eutectic; the rest have melting points that may, however, be lower than the melting points of their constituents.

It may be helpful to recognize that pharmaceutic or physical incompatibles are not unique or characteristic of pharmacy. The general phenomena they exhibit are reproduced repeatedly elsewhere. For example, whenever the two solids, ice and salt, are brought together, even at 0° C., melting occurs. We use this fact in cleaning icy pavements in winter and in freezing and packing ice cream. Under the conditions stated, ice and salt are pharmaceutic or physical incompatibles, to borrow and apply the pharmacists' terms; and this is because the salt solution formed upon contact has a lower melting point than either ice or salt. Only when salt (anhydrous) and ice are brought together in such proportion as to form a mixture containing 23.1 per cent. salt (anhydrous)[5] is the lowest melting point possible in a mixture of ice and salt realized, and therefore only this one particular mixture can properly be called the eutectic.

It is well to point out that the terms *pharmaceutic* or *physical incompatibles* are like the words *saturated solution* in that they refer to phenomena that are limited strictly by temperature. For example, if ice and (anhydrous) salt are separately cooled below —22.4° C., which is their eutectic point, and are then mixed, they will remain side by side as two mixed solids. In other words, below their eutectic point these incompatibles become compatibles. Similarly for all pharmaceutic or physical incompatibles, this kind of incompatibility vanishes when the temperature is lowered to the corresponding eutectic points or is maintained at these or at lower temperatures.

The proportion in which any pharmaceutic or physical incompatibles must be brought together in order to produce the eutectic can be learned only by extended experimentation. In many instances this proportion is as yet unknown. Examples of such studies as are necessary in order to learn these proportions may be found in the work of Philip.[6] His work on ortho-nitro-phenol with para-toluidine illus-

[5] International Critical Tables, I, p. 63, 1926.
[6] *Jour. Chem. Soc.*, 83, p. 821, 1903.

trates the simplest type of such mixtures, and his work on phenol with alpha-naphthylamine furnishes a simple example of cases in which the constituents combine chemically at the time they mutually melt. Similar investigations of the pharmaceutic or physical incompatibles are overdue.

THE PHARMACIST IN RELATION TO THE PUBLIC HEALTH

By Hugh S. Cumming, M. D., D. Sc.,
Surgeon General, U. S. Public Health Service

MR. PRESIDENT and Gentlemen of the American Pharmaceutical Association: First, I desire to express to the association my deep pleasure in having this opportunity to address the representatives of the profession of pharmacy in the United States. The fifty-three thousand drug stores in the United States and the thousands of pharmacists employed therein can, if properly interested, be utilized as an active factor in the promotion of the public health.

The American Pharmaceutical Association is to be congratulated upon the important work it has recently accomplished in connection with the raising of the standards of education of the various accredited schools of pharmacy throughout the United States. It was a pleasure for the United States Public Health Service to co-operate with the committee which studied the formulation of the standard curriculum. It is gratifying to note that the course in public health outlined by the Public Health Service has been incorporated in the approved curriculum. It is believed that his will be of great advantage in giving to the pharmacists of the country the information needed by them relating to public health work. In the great warfare against disease, there are a large number of fighters engaged—health officers, physicians, chemists, physicists, bacteriologists, pharmacists, pharmacologists, and pathologists. All are lending their best efforts toward the eradication of disease and the protection of health.

Preventive medicine has made such great progress within the past half century that many persons regard it as of entirely modern origin. Such, however, is not the case; for in the study of early peoples we almost invariably find that the health of the population was a subject of serious consideration and legislation. Hygiene was practiced by the old Egyptians, who gave special attention to their food

and child welfare. They recognized the danger of floods to health and resorted to preventive methods. Efforts were also directed toward protection against the introduction of plagues. The inhabitants of old India also gave attention to their food, habitation, games, exercises, and the isolation of children in the case of infections. The Mosaic code of laws contains minute directions for personal cleanliness, the purification of dwellings and camps, the selection of healthful and the avoidance of unhealthful foods, the isolation of persons with contagious diseases and various other points bearing on the welfare of the race. The sanitary code of the Hebrews, especially that part which relates to the slaughter of animals, the food supply and its preparation, the care of cooking and drinking utensils, and the ablution of the hands after every unclean act, appears particularly appropriate in the light of our knowledge of infectious germs and germ-carriers gained since the advent of modern bacteriology.

The new hygiene developed within the past fifty years has given us an entirely different conception of many of the factors that enter into the conservation of health and protection against disease. Many an old fallacy has been exploded. The old theory of the spread of disease through fomites, the inanimate things, has been shown to be of far less importance than was at one time supposed. We know that, in fact, this occasionally happens with diseases spread through discharges from the mouth and nose; but instead of accusing letters, books, and materials, as well as furniture and other unlikely things which we formerly disinfected or destroyed, we now think of objects recently moistened with saliva, such as drinking utensils, towels, toys, food and fingers. Many of the sanitary practices of fifty years ago have required considerable modification in the light of our present day knowledge.

Substantial progress has been made by public health authorities in the control and eradication of many of the diseases having an important bearing on the public health. Typhoid fever, which twenty years ago caused more than 50,000 deaths annually in the United States, now causes less than 10,000 deaths per annum. This splendid showing has been due largely to the application of modern scientific methods in the prevention of this disease. Today, typhoid fever is a vanishing disease except in the communities that are negligent in applying the well-known principles of modern sanitary science. From the standpoint of preventive medicine an outbreak of typhoid fever is a reproach to the sanitation and civilization of the community. In

1877 the death rate from typhoid fever in the United States was about forty-five per hundred thousand. In 1910 it was 25.5, and in 1925 it was 8.0 per hundred thousand.

Diphtheria is one of the diseases which has responded quickly to the medical discoveries of the past few years. The first aid to the control of this disease was von Behring's discovery of diphtheria antitoxin. In the period immediately following the general introduction of this antitoxin in the treatment of diphtheria (1894–1905) the death rate in twenty-three American cities declined at the rate of 10.2 per cent. per year. In twenty-eight American cities for which the rates have been computed the decline has been from about 116 per hundred thousand in 1890 to 8 per hundred thousand in 1925. This extraordinary achievement in public health work will probably stimulate campaigns for the better control of other communicable diseases.

Tuberculosis at the present time causes less than one-third of the number of deaths attributed to that disease a generation or more ago. While the reduction of the death rate from tuberculosis has undoubtedly been due in part to natural causes, it is probable that very much more of it has been the result of public health activities. Among the specific measures that have contributed to this result are improved and more correct methods of diagnosis, the pasteurization of milk, the abolition of the common drinking cup and other utensils used in common, the inspection of meat products, and improved housing.

The first whole-time county health department was established in the United States in Yakima County, Washington, in 1911. At the beginning of 1928 there were 414 counties in the United States provided with local health service under whole-time health officers. During the past twelve years the Public Health Service has undertaken a program of co-operative administration in rural health work from which have come many sanitary and economic benefits to the communities and stimulation for the development of whole-time county health service.

It has been shown that money invested in well-directed whole-time health service yields to the average local taxpaying citizen an annual dividend in dollars and cents ranging under different local conditions from 100 to 3000 per cent. A claim made several years ago and not yet successfully challenged is that a dollar invested for well-directed, competent whole-time health service yields to the public welfare more than any other dollar obtainable by taxation of the people can be made to yield in normal times. In the support and encouragement of the

development of efficient whole-time local health departments the pharmacists of this country can lend most helpful assistance.

It has been the experience of those engaged in public health work that there must be co-ordination of efforts in the community. It has been found desirable not to have one agency conduct a campaign directed especially against communicable diseases, another agency attempt to improve the sanitary condition of milk, and still another engaged in maternal and child hygiene. The most effective plan is for all activities having to do with public health to be co-ordinated and correlated under the direction of a whole-time staff of a well-organized and adequately supported official health department.

With a properly organized whole-time health department the local requirements may be carefully studied and attention given to such particular conditions as seem to require special emphasis. For example, in one community it may be necessary to direct special efforts toward the eradication of malaria; in another community the most pressing problem may be the improvement of the sanitary quality of the milk supply; still another may require special attention to the control of communicable diseases, such as diphtheria, scarlet fever, and others.

In attempting to measure the efficiency of health service, consideration must be given to local conditions—climate, topographical, geographic, social, economic, and others—under which the work is done, and to the duration, nature and scope of the activities, the cost of the service and the results obtained.

The pharmacist, as a professional and business man, is concerned not only with public health measures but with personal health measures. The benefits and hazards of the community are common to all, and to advance the public health is a personal obligation. Largely through organized community efforts, the expectation of life at birth (in ancient Rome and present India, less than 25 years, and in George Washington's time about 40 years) has been increased in the United States to 56.74 years for males and 59.59 for females. By means of every public measure designed to prevent sickness and reduce mortality, the pharmacist as well as every other professional and business man takes care of himself and the community. He has an interest in pure water and milk, proper sewage and garbage disposal, vaccination and immunization, research, and the anti-tuberculosis campaign. He knows the value of competent health officers for the city, county, and State, and of health funds sufficient in amount and properly expended.

He is aware that parks, beaches, and other public recreational facilities are related to preventive medicine and to his own well-being directly and indirectly. He sees the benefit of public and private hospitals having ample facilities for the needs of his community with moderate charges for those able to pay and free to the very poor.

The business and economic aspects of public health have long been recognized as being of great importance in any community. The presence of epidemics or pestilential diseases in a locality may adversely affect that community in a number of ways. Quarantines imposed to control the spread of epidemic diseases are always accompanied by great financial loss to the commercial and business interests of a community.

The endemic presence of a given disease in a community is frequently a factor in preventing the business development of that area. For example, persons having control of capital are hesitant about locating important manufacturing establishments or other industries in localities where disabling diseases are known to exist, or epidemics occur frequently. It is only after a community has rid itself of these conditions that commercial development and progress are achieved.

Everyone should have some idea as to what protection of the public health means, what the public should do, and what are the responsibilities of individuals or organizations toward this subject. The pharmacist, as a citizen, owes it both to the community and to himself to keep himself and his family in a continuous condition of good health and so to order his acts that he shall not willingly endanger the lives or health of others through spreading disease.

This sense of personal responsibility toward the public health is one of the qualities of individual citizenship which should be fostered by every means at our command. It is this sense of personal initiative and responsibility and the ability of the individual to think and act for himself which is one of the basic elements of greatness of the American Nation, and which will make possible the development in this country of the most effective system of public health protection.

An important means by which the profession of pharmacy may aid in the promotion of public health is in relation to the promotion of health education. The problem at hand is to have each individual in each community know what he should about diet, exercise, health habits and the importance of physical fitness, and how to avoid transmissible disease.

The teaching force for public health education includes physi-

cians, dentists, pharmacists, and nurses, who are in personal contact with people, and all health officers and sanitarians, who are familiar with environmental conditions.

As a first step in the process of health education, each individual must be made to realize the fundamental importance of national health to national happiness and prosperity. He must not only feel that keeping himself in a healthy condition enables him more than anything else to live a successful, useful, and happy life, but that in doing so he is fulfilling one of the essentials of good citizenship.

One of the great public health problems which confronts all the health authorities of the country is the prevention and control of the venereal diseases. The pharmacists of the country are in a particularly strategic position to co-operate with and assist public health authorities in connection with this matter.

The retail pharmacist has a particularly important relation to the prevention of the spread of venereal diseases because so many patients, particularly with gonorrhea, consult the druggist for advice or medicine for the self-treatment of their condition. In every such instance the druggist should refer the patient to a competent physician or venereal disease clinic.

In 1918–1919, as a part of the venereal disease control program of the Public Health Service, an appeal was sent to 48,500 retail druggists in the United States asking them: (1) Not to prescribe or recommend any remedy for a venereal disease; (2) not to purchase any proprietary remedy to be sold to the public for self-treatment of a venereal disease, and not to sell any such remedy after January 15, 1919; (3) to refill only such prescriptions for the treatment of venereal diseases as were given originally to the customer by a reputable physician who is still in charge of the case; (4) to distribute literature furnished by the Public Health Service to persons asking, without a physician's prescription, for remedies customarily confined to the treatment of a venereal disease, and to direct such persons to a reputable physician, to an approved clinic, or to the State Board of Health.

As a result, 28,226, or nearly 60 per cent., of the druggists agreed voluntarily to co-operate with the Public Health Service in the manner requested. This campaign was followed up by similar efforts on the part of many State health authorities with gratifying results. In many States there are laws or board of health regulations which prohibit the dispensing of remedies for treatment of the venereal diseases except on the prescription of a physician.

Prompt and adequate medical treatment of the venereal diseases is the most important single weapon available for their control. Self-treatment frequently produces irreparable damage and should be discouraged by all means possible. No reputable pharmacist will knowingly aid in providing a patient with material for such self-treatment.

Recognizing the importance of adequate treatment facilities, State health authorities, with the co-operation of the Public Health Service, established free clinics for the treatment of indigent patients suffering from venereal diseases. There are in operation now about 460 such clinics. In addition there are about 300 dispensaries operated as part of out-patient departments of hospitals, or otherwise, which are not under the direct supervision of health authorities.

Druggists, physicians, and health officers, all must educate venereal patients relative to the necessity for prompt and thorough treatment of the venereal infection. To delay treatment for the venereal diseases only fastens the hold of the infection on the system and allows it to spread and become firmly established. To start off with a temporary or makeshift self-treatment has the same effect. Either may be done in an effort to conceal the trouble or to save money, but the means defeats the end. Venereal disease improperly treated will persist and eventually a much worse condition develops requiring greater care and the larger expenditure of money in the long run than otherwise would have been the case.

In directing persons suffering from venereal diseases in the manner just suggested, the pharmacists of the country will build for themselves a public confidence of great value, and at the same time they will have the personal satisfaction of knowing that their best efforts are being given toward the elimination of the venereal scourge in their respective communities.

The pharmacist also has a definite responsibility as relates to the public health in the keeping and dispensing of biological products that are used in the treatment of the diseases of man. Through a wise provision of Congress, which became effective in 1902, the supervision of the sale of all biological products for use in the treatment of human beings was placed under the direction of the Public Health Service. The proper preservation and dispensing of such biological products is a responsibility of the individual retail pharmacist. Diphtheria antitoxin, tetanus antitoxin, the toxin-antitoxin mixture, smallpox vaccine, and numerous other related products must be carefully protected and preserved while stored in the retail drug store. The pharmacist should

observe great care in maintaining such products at the prescribed and proper temperature, and in returning to the manufacturer such products that have been held past the date fixed for their sale.

With the development of more recent public health methods, the use of disinfectants and fumigation, following various diseases, has been to a large measure discontinued. It is now recognized that mechanical cleansing, by means of soap and water, followed by airing and exposure to sunlight, are the measures most efficacious and best suited to the treatment of rooms formerly occupied by persons ill from communicable diseases. It is a matter, therefore, of some importance that pharmacists should exercise care in the dispensing of fumigants and disinfectants to the public. An effort should be made to sell these articles only where they will be used under proper conditions and where they will be most effective.

The accepted business principle of periodical inspection and timely repair of machinery is particularly applicable to the human machine. The annual physical examination offers a most valuable method of prolonging life, increasing efficiency, and reducing to a minimum the amount of time lost on account of sickness. This examination should constitute an annual stock taking of that very essential commodity, the health of the individual. These physical examinations offer the means whereby diseases and abnormal conditions may be recognized early, thereby affording an opportunity to institute proper measures to alleviate, wherever possible, any disease or abnormality which may be detected. No machine is more amenable to the correction of certain defects than the human body, which, while not altogether fool-proof, is more nearly so than any contraption of steel and wood. Chagrin and alarm at finding a disease requiring treatment or a defect needing correction are not good reasons for avoiding the facts. It would be a serious reflection upon good business sense to neglect to apply such a reasonable and well-recognized business requirement. Life insurance companies have found that policy holders examined each year show a death rate 25 per cent. less than do others from the same group at large not so examined. The pharmacists of the country can aid materially in health work by encouraging and advocating periodic health examinations for the general public.

In the field of public health, especially in public health education and the support of and co-operation with the official health agencies, the pharmacists of this country have their opportunity and responsibility in contributing toward the efficacy of applied public health science.

THE SIXTH ANNUAL PLANT SCIENCE SEMINAR

The Sixth Annual Plant Science Seminar convened at Boston, Mass., on August 13, 1928, with the largest attendance since it was organized five years ago.

Addresses by Dr. J. P. Bill, of the New England Botanical Club; Dr. Francis Lazenby, superintendent of Harvard University Botanical Gardens; Mr. H. C. Lythgoe, chief chemist of the Massachusetts Department of Health, and many pharmacists of national reputation, were presented to the Seminar during the four days' gathering.

The feature of the opening session was an address by Dean Theodore J. Bradley, in which he paid a high compliment to the botanists and pharmacognocists who had organized the Seminar and were carrying on its work.

Chairman H. W. Youngken in the annual address stressed the great progress made by pharmacognosy in recent years. He declared that the advance of the science in America within recent years was in large measure due to the Seminar, which had enabled teachers and workers to confer and exchange ideas and methods in a manner impossible without the aid of the Seminar. The chairman recommended that the Seminar go on record as favoring a separate section for pharmacognosy and pharmaceutical botany at the Fifth International Botanical Congress at Cambridge, England, in 1930. This was unanimously adopted.

The members of the Seminar were invited to attend the congress.

In view of the intense interest and value of the exchange of herbarium specimens and drugs, as suggested by former chairman E. L. Newcomb, the continuance of this custom at future Seminars was unanimously endorsed.

Pharmacognocists from all over the country were in attendance, and letters, telegrams and cablegrams were received from scientists in all parts of the world, who were unable to be present.

Among those present at the Seminar were the following:

Prof. F. H. Eby, Temple University, Philadelphia, Pa.
Prof. Paul Q. Card, Philadelphia College of Pharmacy and Science, Philadelphia, Pa.
Prof. Wm. J. Stonebach, Philadelphia College of Pharmacy and Science, Philadelphia, Pa.
Prof. L. J. Freeman, Philadelphia College of Pharmacy and Science, Philadelphia, Pa.

Dr. Arno Viehoever, Philadelphia College of Pharmacy and Science, Philadelphia, Pa.
Dr. Charles C. Plitt, College of Pharmacy, University of Maryland.
Dr. Willard W. Eggleston, U. S. Bureau of Plant Industry.
Dr. George H. Needham, Squibbs' Laboratory, Brooklyn, N. Y.
Dr. R. A. Konnerth, Squibbs' Laboratory, Brooklyn, N. Y.
Dean W. B. Day, University of Illinois, College of Pharmacy.
Prof. E. N. Gathercoal, University of Illinois, College of Pharmacy.
Prof. E. H. Wirth, University of Illinois, College of Pharmacy.
Dr. B. V. Christensen, University of Florida, College of Pharmacy.
Prof. A. H. Uhl, Valparaiso University, College of Pharmacy, Ind.
Prof. F. J. Bacon, Western Reserve University, College of Pharmacy.
Dr. W. O. Richtman, University of Wisconsin, College of Pharmacy.
Prof. E. B. Fischer, University of Minnesota, College of Pharmacy.
Prof. George L. Burroughs, University of Mississippi, College of Pharmacy.
Dr. E. L. Newcomb, Secretary, N. W. D. A., New York, N. Y.
Dean Charles E. Mollett, University of Montana, College of Pharmacy.
Prof. O. P. M. Canis, Rutgers University, N. J., College of Pharmacy.
Dean Theodore J. Bradley, Massachusetts College of Pharmacy.
Dr. H. W. Youngken, Massachusetts College of Pharmacy.
Mr. Irving P. Gammon, Trustee, Massachusetts College of Pharmacy.
Mr. William H. Glover, Trustee, Massachusetts College of Pharmacy.
Mr. William A. Acheson, Trustee, Massachusetts College of Pharmacy.
Mr. Howard L. Reed, Massachusetts College of Pharmacy.
Mr. Richard W. St. Clair, Massachusetts College of Pharmacy.
Prof. Florin J. Amrhein, Massachusetts College of Pharmacy.
Prof. Leon A. Thompson, Massachusetts College of Pharmacy.

Among the ladies in attendance were Mrs. Day, Gathercoal, Richtman, Youngken, Bradley, Plitt, Stonebach, Wirth, Bacon, Eby, and the Misses Grace Bradley, Helen Owens and Marion Youngken.

A cablegram from Paris, France, was received from Prof. F. Eaton, formerly of Connecticut College of Pharmacy. Letters and telegrams were received from Dr. L. K. Darbaker, Pittsburgh College of Pharmacy; Prof. A. John Schwartz, University of Tennessee School of Pharmacy; Dr. L. J. Petry, of Hendrick College, Arkansas; Prof. L. J. Schwartz, U. S. Commissioner in West Africa; Dr. George L. Keenan, micro-analyst of the U. S. Department of Agriculture; C. J. Zufall, of Purdue University, and Dr. W. O. Emery, of the U. S. Bureau of Chemistry.

The additional features of the program were as follows:

Teaching Methods with Exhibits, Prof. E. A. Wirth;
Medicinal Plants of Florida, Prof. B. V. Christensen;
More About Digitalis, Prof. W. J. Stonebach;
Report on progress of census on commercial and geographical sources of American medicinal plants (auspices of National Research Council, Committee on Pharmacognosy and Pharmaceutical Botany), Dr. W. W. Stockberger (read by Dr. W. W. Eggleston);
On Abbreviations of the U. S. P. X and N. F. V; On Preparation of Slides of Squills, Prof. C. C. Plitt;
Drug Testing; On Soil Fertilization, Dr. Arno Viehoever;
What a Flower Show May Mean to a Pharmacy Student, Prof. Marin S. Dunn;
Pharmacy Week Window Display and the Pharmacognocist; The Pharmacy Headquarters Bulletin and the Pharmacognocist, Dr. E. L. Newcomb;
Color Nomenclature of the U. S. P., Prof. E. N. Gathercoal;
Studies on Peppermint (illustrated), Prof. F. J. Bacon;
Pharmacographia Americana, Dr. W. O. Richtman.

The demonstrations and discussions were intensely interesting. A large number of herbarium specimens and rare drug samples were exchanged and a new source of supply of Veratrum was reported in Northern Jersey. The botanical trips and excursions to Harvard University Botanical Garden, Gray Herbarium, Agassiz Hall, Arnold Arboretum, the coastal regions about Nahant, Mass., and to Lexington and Concord and other historical points were very much enjoyed and very instructive.

The dean and board of trustees of the Massachusetts College of Pharmacy provided an elaborate luncheon each day in the alumni room, which was greatly appreciated by all members.

The 1929 Seminar will be held in the West, the exact place of which will be announced in the near future.

CHAIRMAN'S ADDRESS, PLANT SCIENCE SEMINAR SESSION OF 1928

By Heber W. Youngken

We have come together for the sixth annual session of the Plant Science Seminar, an event which those of us who witnessed the initial meeting of this organization five years ago at the University of Minnesota could then well have heralded, if the knowledge gained, the social contacts made and the recreation enjoyed were rightly appraised at the close of that memorable gathering.

The first series of meetings were an experiment, and the founders little realized how well they planned and how strongly they built. They builded the spirit of intellectual friendship into the hearts of all in attendance, a spirit which binds all Plant Science Seminar members into one harmonious group, as fellow-workers in a common cause, namely, the advancement of education in pharmacognosy, plant chemistry and affiliated sciences.

The objects of this Seminar from its inception have been *first,* the bringing together annually of our professional contemporaries alike for social contact and the mutual exchange of ideas and methods; *secondly,* opportunity for the acquisition of new facts by members through field trips in varied sections of the country and by laboratory practice and demonstrations in which every one is invited to take part; *thirdly,* stimulation of research in connection with pharmacognosy and plant chemistry.

As a co-operative unit, there are few organizations which have equaled in accomplishments for a like period of time the history of the Plant Science Seminar.

Before our organization loomed upon the horizon there was between American pharmacognocists little co-operation of purpose, less correlation of work and considerable duplication of effort. Today there is a marked improvement in these conditions, largely due to the influence and co-operation of the National Conference of Pharmaceutical Research, the Committee on Pharmacognosy and Pharmaceutical Botany of the National Research Council and the Plant Science Seminar.

It is the spirit of willingness to co-operate in the working out of scientific problems and of improved teaching methods which has ever been a strong feature of our Seminar and which we should foster

throughout this and all future sessions. Every one who has attended our meetings regularly has caught some of this spirit and has, accordingly, gained far more than he or she has contributed.

As a result of this splendid co-operation, pharmacognosy has made greater advances in America during the past five years than in any equivalent period in the history of our republic.

Our influence is making itself felt in every sphere of pharmaceutical endeavor in which the materia medica sciences play a part. Many instances of the usefulness of our organization might be cited, but many of these are too well known to our older members for me to make more than brief comment, and this for the benefit of our younger members. Our opinion has been sought in U. S. P. and N. F. Revision problems; the growth of young teachers attending the Seminar has been marked and their prestige advanced either as a direct or indirect result of their Seminar experiences. Representatives of this organization are playing an active part in the work of State and National Pharmaceutical Associations, in the National Research Council, in the National Conference of Pharmaceutical Research, in the American Association of Colleges of Pharmacy, in biological abstracts and other journalistic work.

For the first time in the history of the International Botanical Congress, pharmacognosy and pharmaceutical botany recently had representation as a separate section known as Section K. I allude to the memorable Fourth International Botanical Congress held at Ithaca in 1926. The majority of those attending Section K were members of our own Plant Science Seminar and the officers of the section were active members of this group.

The Fifth International Botanical Congress will be held in Cambridge, England, in 1930, and it is the feeling of your chairman that we should plan to meet there at that time. The British botanists have charge of the program for this congress and have already sent out a preliminary notice outlining the sections into which this congress will be organized, according to their arrangement on February 1, 1928. I have no knowledge of a subsequent notice having been issued to date. All of the sections planned for in that initial notice represented fields of pure botanical endeavor, no provision having been made therein for pharmacognosy and pharmaceutical botany. As a step toward representation of these phases of botany at the Fifth International Botanical Congress in a separate section, I would recommend that the Plant Science Seminar communicate its desire to have pharmacognosy and

pharmaceutical botany represented as a separate section at the Cambridge, England, Congress of 1930 to the Interim Committee of Section K. This committee was authorized at a general session of the Fourth International Congress held at Ithaca in 1926 to attend to all section matters in the interim between the close of the fourth and beginning of the fifth congress. The committee at present consists of Rusby, Stockberger and Youngken. Having once established a position for our group on the program of the next International Botanical Congress, we would have little anxiety about the participation of foreign pharmacognocists with us.

The spirit of informality about our annual gatherings is most wholesome and I trust it will be in evidence at this Seminar gathering. While we have been favored with healthful progress, there is much to be done toward the building up of our organization in numerical strength. There is especial need for additional recruits from the ranks of the younger teachers. The Seminar provides a means for the dissemination of friendly advice and profitable knowledge from the older to the younger members. Each year new recruits from among the younger men and women have been added, but there are still a number of schools not represented in our body. Efforts should be made by individual members acquainted with non-member teachers and plant science workers to interest them in our organization.

The practice of meeting in different sections of the country as near as possible to the place selected each year for the A. Ph. A. convention is sound from the viewpoints of economy, convenience and time-saving for the majority of our members, and I would urge that it be continued as a general rule, but not as a binding rule, in all instances where the facilities for conducting our Seminar are in keeping with the Seminar needs.

The exchange of herbarium specimens from different localities is an innovation of this year's Seminar. The idea was conceived by our first Seminar chairman, Dr. Newcomb. As he is scheduled to speak on this topic at a later session, I will not attempt to steal his thunder. However, I do want to strongly recommend that it be made a feature at each of our future annual gatherings.

Finally, may I express the wish that each of you take an active part by assisting your officers in making our meetings here a success intellectually and socially.

REPORT OF COMMITTE ON DRUG MARKET *

Pennsylvania Pharmaceutical Association at Buena Vista, June 19th to 21st, 1928

THE WORK OF your Committee during the past year has been along the same general lines as given in former reports. The information given represents the results obtained in several laboratories having supervision over crude material as well as control over various manufacturing steps. For the sake of brevity, only those substances of decidedly unsatisfactory quality, or as in a few instances, those of exceptional quality are included in our report.

Considering the large number of samples examined, the proportion of unsatisfactory material is rather small and we are able to state, as on many previous occasions, that the quality of the goods offered is very favorable. In line with this opinion we wish, first, to mention the goods of outstanding quality such as the alkaloid containing drugs which we are pleased to note have been of very good quality. In this class we have belladonna leaves, cinchona—red and yellow, colchicum seed, hydrastis, hyoscyamus and ipecac. Except in two instances all samples were of U. S. P. quality and in some instances were two to three times more than the U. S. P. minimum standard; thus we find belladonna leaves containing 0.65% alkaloids, red cinchona containing 10.28%, and yellow cinchona with 18.07% alkaloids. An unusual sample of hyoscyamus contained 0.093% alkaloids.

The condition of the physiologically tested drugs was not as favorable although all the rejections were confined to strophanthus and ergot. G. A. Slothower reports the rejection of all the samples of strophanthus and one of the three samples of ergot. J. W. E. Harrisson also gives an unfavorable report of ergot.

Classifying the reasons for the rejection of various shipments and samples of drugs, we find that they are mainly due to substitution or adulteration, the presence of dirt, and contamination with other parts of the plant or with other drugs. Undoubtedly, the most important of these is the first mentioned, among which we find buckthorn berries which were entirely spurious; gambir which was found

*Presented at the Annual Meeting of the Pennsylvania Pharmaceutical Association at Buena Vista, June 19 to 21, 1928.

to be black catechu; hemlock bark consisting entirely of the outer instead of the inner bark; piscidia consisting almost entirely of the green stem or trunk bark instead of the root bark, and wild lettuce containing 50% of mint leaves.

Drugs containing large amounts of dirt were caulophyllum and aletris which was also contaminated with false unicorn root.

Improper or careless gathering is probably the cause for the condition of various contaminated drugs. This condition occurs to an appreciable extent in some instances as illustrated by chimaphila which contained 25% of stems.

Less serious conditions are found in cimicifuga which contained stone-root and another foreign root; black haw and wahoo which contained an excess of adhering wood; sanguinaria containing trillium and squaw vine contaminated with foreign organic matter.

In addition to the foregoing conditions we usually find drugs that are of objectionable quality on account of age or improper storing. This year we have only two instances in a sample of squill which was wormy and decomposed and a sample of echinacea which had lost its characteristic odor and taste.

Substances outside of the crude drug field require very little comment.

Among the chemicals the only item of interest is potassium iodide which contained an excess of sulphates and was only 96.41% pure. A sample of soap was found to contain animal fats and a sample of cod liver oil had a low iodine value and contained an excess of unsaponifiable matter.

The existence of the foregoing conditions is emphasized by your committee in order to bring it more definitely to the attention of the profession. The reason for this is quite apparent as for instance, a lot of bark containing 25% of adhering wood known to have little or no medicinal value has only 75% of its therapeutic value. The same thing is true of drugs containing large amounts of earthy material, or any other foreign material the presence of which may not be deleterious in itself but which serves proportionately to reduce the effectiveness of any preparation made from it and also only partially produces the results expected by the physician.

The following substances were examined in the H. K. Mulford Co. laboratory, the LaWall laboratory and the Smith, Kline and French Co. laboratory during the period from May 31, 1927, to June 1, 1928.

Acetone

This substance usually complies with the U. S. P. requirements. Of the ten lots examined eight were satisfactory in every respect. The other two yielded an excess of residue upon the evaporation of 50 cc. One of these yielded .172 gm. of residue upon first weighing but upon repeated drying at 100° C., and weighing, was finally reduced to .0011 gm. The residue was undoubtedly an end product present because the manufacturer carried the distillation beyond the U. S. P. boiling point.

—Reported by T. R. Singer.

Aconite Root

All samples examined were above U. S. P. X Standard.

—Reported by J. W. E. Harrisson.

Aletris

Two samples were excessively dirty, one of them showing contamination with False Unicorn Root.

—Reported by H. Haefelin.

Belladonna Leaves

The following amounts of alkaloids were found in the four samples assayed: 0.65%, 0.55%, 0.49% and 0.48%. The U. S. P. Standard is not less than 0.3% alkaloids of Belladonna Leaves.

—Reported by K. Suto.

Belladonna Root

An excess of stems was present in one sample, another sample contained an excess of moisture.

—Reported by H. Haefelin.

Black Haw Bark

One sample contained 25% of wood whereas the N.F. permits only 7% of wood or other foreign matter.

—Reported by H. Haefelin.

Buckthorn Berries

One sample consisted entirely of a spurious unidentified berry.

—Reported by G. Slothower.

Capsicum

The non-volatile ether-soluble extractive content of one sample was 15.57%, which is well within the U. S. P. requirement of not less than 12%. The sample, however, did not meet the U. S. P. "pungency" test and had a very poor odor.

—Reported by J. Farley.

Carbon Tetrachloride

All shipments were of satisfactory quality except that some had been placed in wet drums. This condition is objectionable particularly if the product is to be used in cleaning cloth.

—Reported by T. R. Singer.

Casein

The fat content of one lot of Casein was 0.73% whereas the U. S. P. permits only 0.5%.

—Reported by H. Luckings.

Caulophyllum

Three samples submitted were excessively dirty.

—Reported by H. Haefelin.

Chimaphila

Stems were present to the extent of 25% in one sample. The N.F. Standard permits only 5% of stems or other foreign organic matter.

—Reported by H. Haefelin.

Cimicifuga

One lot was rejected because of the presence of Stone Root and another foreign root.

—Reported by H. Haefelin.

Cinchona Red

The assay of one sample showed the presence of 10.28% alkaloids.

—Reported by R. Beresford.

Cinchona Yellow

Six samples yielded the following amounts of alkaloids: 8.28%, 6.37%, 10.87%, 18.07%, 6.01% and 7.25%. The U. S. P. requires not less than 5% of the alkaloids of Cinchona.

—Reported by R. Beresford.

Cod Liver Oil

One lot was rejected because it showed an iodine value of 136.6 and contained 1.7% of unsaponifiable matter. The U. S. P. range for the iodine value is 140 to 180 and the unsaponifiable matter should not exceed 1.5%.

—Reported by J. Dailey.

Colchicum Seed

The following amounts of colchicine were present in the six samples assayed: 0.46%, 0.48%, 0.506%, 0.406%, 0.49% and 0.59% colchicine. The U. S. P. Standard is not less than 0.45% colchicine.

—Reported by K. Suto.

Colocynth

Two samples submitted for examination showed seeds in excess of the U. S. P. limit of not more than 5%.

—Reported by H. Haefelin.

Cresol

Four lots were examined, two of which were of U. S. P. quality. One of the unsatisfactory lots had a decided abnormal odor of sulphur compound. The other had a high specific gravity and a low boiling point, yielding 30% of distillate under 195° C.

—Reported by A. F. Murray.

Dextrose

One lot was rejected because of the presence of chlorides in excess of the U. S. P. limit. Two other lots showed the presence of dextrin.

—Reported by H. Luckings.

Digitalis Leaves

All samples were above the U. S. P. X Standard.

—Reported by J. W. E. Harrisson.

ECHINACEA

One lot was practically odorless and tasteless. The N.F. directs "Echinacea must not be used after it has lost its characteristic odor and taste."

—Reported by H. Haefelin.

EPHEDRA

Eight samples showed the following amounts of alkaloid: 0.262%, 0.58%, 0.35%, 0.954%, 0.67%, 1.18%, 0.667% and 0.819%.

—Reported by K. Suto.

ERGOT

Importation of ergot has been rather restricted. A few samples examined were rejected.

—Reported by J. W. E. Harrisson.

GAMBIR

One lot submitted as Gambir proved upon examination to be Black Catechu.

—Reported by H. Haefelin.

GLYCERIN

A sample labeled U. S. P. and another labeled B. P. showed the presence of traces of chlorides and sulphates. The sample labeled U. S. P. yielded 0.0081% of mineral residue while the B. P. sample showed 0.0087%. The U. S. P. allows not more than 0.007%.

—Reported by J. Farley.

GLYCERIN

Of the sixteen lots tested twelve were of U. S. P. quality. Of the other four, two were low in specific gravity, one contained an excess of fatty acids, and the other an excess of carbonaceous and mineral residue.

—Reported by T. R. Singer.

GLUCOSE

One sample had a decided greenish color and yielded 0.2% more ash than the U. S. P. limit of "not more than 0.5%." It contained 11.77% of water which is well within the limit of 21% permitted by

the U. S. P. and close to the range of 12% to 15% usually found in samples examined during recent years.

—Reported by T. R. Singer.

Guaiac

The analysis of one sample submitted showed that it contained 26.48% of alcohol-insoluble matter. The N.F. requires "not more than 15% alcohol-insoluble matter."

—Reported by J. Dailey.

Hemlock Bark

One lot consisted entirely of the outer bark whereas the inner bark is desired.

—Reported by H. Haefelin.

Hydrastis

The alkaloidal content of three lots was 3.18%, 2.75%, and 2.57% respectively of the ether-soluble alkaloids of hydrastis. The U. S. P. requires "not less than 2.5% of ether-soluble alkaloids."

—Reported by R. Beresford.

Hyoscyamus

One lot showed the presence of 0.0934% alkaloids. The U. S. P. Standard is not less than 0.065% alkaloids.

—Reported by H. Luckings.

Ipecac

Twelve samples yielded the following amounts of alkaloids upon assay: 2.48%, 2.12%, 2.40%, 2.32%, 2.33%, 2.33%, 2.33%, 2.31%, 2.30%, 2.28%, 2.12% and 1.95% . The U. S. P. Standard is not less than 1.75% ether-soluble alkaloids of Ipecac.

—Reported by K. Suto.

Kieselguhr

Two lots were rejected because of the presence of sulphates and two others because of the presence of carbonates.

—Reported by J. Dailey.

Magnesium Oxide

Light Calcined. Two lots contained an excess of iron and were respectively 5.82% and 1.17% low in strength.

—Reported by T. R. Singer.

Nux Vomica

Six samples assayed as follows: 2.35%, 2.53%, 2.04%, 2.85%, 2.74% and 2.55% alkaloids. The U. S. P. Standard is not less than 2.5% of the alkaloids of Nux Vomica.

—Reported by K. Suto.

Oleoresin of Male Fern

The examination of four samples showed the following amounts of crude filicin: 22.61%, 22.4%, 22.69% and 24.2%. The U. S. P. Standard is not less than 24% crude filicin.

—Reported by R. Beresford.

Petrolatum—Liquid

All lots were odorless, water-white, free from bloom and tasteless except one lot which had a slight foreign taste.

—Reported by A. F. Murray.

Piscidia

Two samples consisted almost entirely of the green stem or trunk bark whereas the root bark is desired.

—Reported by H. Haefelin.

Podophyllum, Indian

One lot showed the presence of 16.17% of Indian podophyllin. The B. P. Codex states Indian Podophyllum will yield 6% to 12% of podophyllin.

—Reported by K. Suto.

Potassium Iodide

Sulphate was present in excess in one sample which upon analysis showed only 96.41% of Potassium Iodide.

—Reported by J. Dailey.

Sanguinaria

The analysis of one sample showed the presence of 3.37% of alkaloids. An arbitrary standard of 2.5 alkaloids is given for Sanguinaria.

Another lot upon examination showed contamination with Trillium.

—Reported by H. Haefelin.
K. Suto.

Senna Leaves

The emodin content of four lots of Tinnevelly Senna was as follows: 0.77%, 0.79%, 0.70% and 0.89%. An arbitrary standard for the emodin content of Senna Leaves is 0.75%.

—Reported by K. Suto.

Sapo

One lot was rejected because of the presence of animal fats.

—Reported by J. Farley.

Scilla

One sample contained portions of the outer part of the squill bulb and was excessively wormy with many pieces partially decomposed.

—Reported by H. Haefelin.

Soap—Castile

Sample was of U. S. P. quality except for a low iodine number of 79 which is below the U. S. P. Standard of 84 to 90.

—Reported by T. R. Singer.

Soap—Soft

Two lots contained slightly excessive amounts of water. One lot was entirely lacking in alkalinity and one contained only about one-half the minimum limit of 0.1% as required by the U. S. P.

—Reported by T. R. Singer.

Solution of Calcium Hydroxide

Four lots contained respectively 0.158 gm., 0.181 gm., 0.158 gm., and 0.163 gm. of calcium hydroxide in 100 cc. thereby complying with the U. S. P. requirement of not less than 0.14% of calcium hydroxide.

—Reported by T. R. Singer.

Solution of Formaldehyde

Only two of the seven lots examined were strictly of U. S. P. quality. The other five lots were a little low in strength ranging between 0.16% to 0.75% below the U. S. P. Standard of not less than 37%.

—Reported by T. R. Singer.

Solution Magnesium Citrate

Each of the elevent lots examined was of U. S. P. quality except one which had an excess of sulphates.

—Reported by T. R. Singer.

Spigelia

Determination of the ash content of two lots yielded respectively 21.08% of total ash and 14.42% of acid-insoluble ash and 17.9% of total ash and 12.32% of acid-insoluble ash.

An examination made to determine the ash content of a hand cleaned sample yielded 6.22% of total ash and 1.46% of acid-insoluble ash. The sample was cleaned as thoroughly as possible but the acid-insoluble ash was gritty and sandy, showing the presence of earthy material. It is probable that the normal ash content is about 5%.

—Reported by J. G. Roberts.

Squaw Vine

Foreign organic matter was present in three samples to the extent of 11.5%, 15.8% and 12%. The N.F. permits only 5% of foreign organic matter.

—Reported by H. Haefelin.

Storax

Two samples were rejected because they lost 27.5% and 24.2% of their weight when dried for 2 hours at 100° C. The U. S. P. limits the loss in weight to not more than 20%.

—Reported by H. Luckings.

Tonga

One lot was rejected because it consisted only of the bark of Premna arborea whereas N. F. Tonga is a mixture of equal parts of the bark of Premna arborea and Epipremnum pinnatum.

—Reported by H. Haefelin.

Valerian

Three samples were of sub-normal quality; two were excessively dirty and one contained 14.7% of acid-insoluble ash. The U. S. P. allows only 10% of acid-insoluble ash.

—Reported by H. Haefelin.

Wahoo Bark

Adhering wood was present in one sample to the extent of 16.6%. The N.F. permits not more than 5% of adhering wood.

—Reported by H. Haefelin.

Wild Cherry Bark

One sample was considered unsatisfactory because it lacked the characteristic wild cherry odor and did not develop it upon maceration with water.

—Reported by J. G. Roberts

Wild Lettuce

The cultivated garden lettuce is continually being offered for the wild variety. Two lots examined were found to be contaminated with spearmint and peppermint leaves; one lot containing over 50% of the mint leaves.

—Reported by G. Slothower.

Yerba Santa

Three samples submitted for examination showed the presence of 8.6%, 11% and 14% of stems. The U. S. P. allows the presence of not more than 5% of stems.

—Reported by H. Haefelin.

SPICES

Sample	No. Examined	No. Rejected	Ash Max.	Ash Min.	Acid Insol. Ash Max.	Acid Insol. Ash Min.	Non-Vol. Ether Extract Max.	Non-Vol. Ether Extract Min.	Vol. Ether Extract Max.	Vol. Ether Extract Min.	Crude Fiber Max.	Crude Fiber Min.	Calcium Oxide Max.	Calcium Oxide Min.	Cold Water Extract Max.	Cold Water Extract Min.
			%	%	%	%	%	%	%	%	%	%	%	%	%	%
Allspice	8	0	5.07	3.95	0.25	0.10	8.80	3.90			23.70	19.75				
Celery Seed	2	0	10.02	9.42	1.17	0.92	26.60	25.80								
Cinnamon	15	4	9.22	2.95	3.45	0.17	4.30	1.77	4.40	2.15						
Cloves	10	0	6.35	5.60	0.30	0.15	8.70	6.80	22.50	17.85						
Coriander	8	0	6.60	5.45	0.80	0.32	23.35	15.62								
Ginger	11	1	6.75	3.45	0.72	0.10					6.95	3.30	0.80	0.32	17.25	13.30
Mace	14	2	3.10	1.87	0.72	0.20	30.55	22.27								
Marjoram	1	0	11.50		1.50											
Mustard	2	0	4.95	4.60	0.30	0.20	31.20	28.45								
Nutmeg	8	0	2.10	1.70	0.45	0.10	40.05	34.20								
Paprika	11	2	9.50	7.12	0.55	0.15	12.50	9.82								
Pepper																
Black	19	2	7.10	4.35	0.60	0.20	9.90	7.15								
White	21	0	1.95	0.80	0.30	0.10	9.37	7.10								
Red	8	2	8.80	5.00	1.60	0.10	19.37	17.80								
Cayenne	4	2	7.05	4.66	0.66	0.45	23.40	14.45								
Sage	1	0	8.65		0.90											
Thyme	1	0	9.50		1.32		6.00									

One sample of ginger not included in the foregoing table was particularly poor as it yielded 10.17% ash and contained calcium equivalent to 2.4% calcium oxide.

A large proportion of all spices sold go into the manufacture of sausage, frankfurters and bologna. Recently an emulsion of spice oils for use in such products has appeared on the market. The claims made for this new product are many, and range from preservation of the meat to an improvement in appearance of the product. Some manufacturers are, no doubt, using products of this type and it remains to be seen if they will adopt them permanently.

—Reported by J. W. E. Harrisson.

The following table shows the seventh report on the weight of unit volume of crude drugs made in the Analytical Department of the H. K. Mulford Company, during the year June 1, 1927, to June 1, 1928:

Drug	Vol. cc.	Weight gms.	Aver. 1927-28	Aver. 1926-27	Remarks
Angelica Seed	100	36			
Caraway	100	51			
		48			
		49			
		51	49.8	50.8	
Cardamon	100	64			
		65.6			
		63.2			
		68.8			
		65	65.3	62	
Celery	100	49	49	53.6	
Cloves	100	36	36		
Cochineal	100	44			
		46	45		
Colchicum	100	76			
		75	75.5		
Cubeb	100	28			
		30			
		28			
		29	28.5	30.8	
Ergot	200	86			
		98			
		88			
		90			
		92			

Drug	Vol. cc.	Weight gms.	Aver. 1927-28	Aver. 1926-27	Remarks
Ergot	200	106			Activity 87.5%
		102			Russian Ergot
		98			Russian Ergot
		100	95.2	92.8	
Fennel	100	33	33		
Juniper	100	28			
		30			
		28	28.6		
Larkspur	100	46			
		42.8			
		46			
		42			
		46			
		44	44.5	48.8	

—Reported by H. Haefelin.

The following table shows the result of the physiological assay of 28 crude drugs made in the Physiological Testing Department of the H. K. Mulford Company during the year June 1, 1927, to June 1, 1928:

Drug	No. Samples	Assay Lowest	Assay Highest	Above	Below
Aconite	6	166%	250%	6	0
Digitalis	9	102	120	9	0
Ergot	3	87.3	160	2	1
Squill	5	103	137	5	0
Strophanthus	5	54.5	96	0	5
Total	28			22	6

Therefore, 78% of the crude drugs were above standard.

—Reported by P. Masucci
and A. Quici.

Respectfully submitted,

J. G. Roberts,
Chairman,
Howard E. Smith,
J. W. E. Harrisson,
G. A. Slothower.

THE HISTORIAN'S REPORT*

By E. G. Eberle

THE HISTORY of synthetic chemistry dates from the year of Friederich Wöhler's publication of the discovery of the synthesis of urea, 1828; and this is the centenary year of that epoch-making discovery. Liebig and Wöhler were co-workers; the latter was for a time pharmaceutical inspector. The American Chemical Society plans to celebrate the centenary of this achievement by a special program at its Boston meeting in September. With the publication of Wöhler's classic paper, synthetic chemistry may be said to have had its origin.

Fifty years ago our fellow-member, John Uri Lloyd, contributed a series of papers to the American Pharmaceutical Association, embodying studies in physics as applied to or involved in pharmacy. Dr. Wolfgang Ostwald recognizes the work of Professor Lloyd as the foundation of colloidal chemistry. The continued interest of the former in these investigations is shown by a report made in the August number of the *Journal A. Ph. A.* These historical references are made to show the participation of pharmacists in science and presents an opportunity of recording the importance of pharmacy therein.

This is also the centenary year of the birth of Frederick August Flückiger, an honorary member of our association until his death December 11, 1894. The Gesellschaft Für Geschichte Der Pharmazie has published a sketch of Dr. Flückiger by Privatdozent, Dr. J. A. Häfliger of Basel. The booklet has nine illustrations: On the cover, a picture of Dr. Flückiger; the Flückiger Medal which was founded in 1892, a certificate as honorary member of the Pharmaceutical Society of Great Britain, of the Pharmaceutical Society of Brussels, of the Society of Natural History of Switzerland, certificate of honorary membership in the College of Pharmacy in the State of New York, certificate of the Italian Pharmaceutical Association, of the Austrian Society, and finally a half-tone of the grave of Professor Flückiger in Berne.

We have lost three of our honorary members since last we met, Sir William S. Glyn-Jones, of England; Dr. John George Gadamer,

*Presented at the 1928 meeting of the American Pharmaceutical Association.

of Germany; Dr. M. Leon Guignard, of France; also three former presidents, and our honorary president of the year coming to an end, and the founder of a scholarship.

Few if any pharmacists have contributed so largely to the welfare of the retail drug trade of Great Britain as Sir William S. Glyn-Jones, and his work in Canada had gone well forward at the time of his demise. In addition to his connection with the Proprietary Articles Trades' Association, Sir William was secretary of the Pharmaceutical Society of Great Britain from 1919 to 1926. As a youth he served apprenticeship, and later engaged as pharmacist on his own account. He studied law and was admitted to the bar in 1904, and was a member of Parliament from 1911 to 1918; in 1919 he was knighted.

Prof. Dr. John G. Gadamer was one of the foremost pharmacists engaged in research work. He succeeded the late Prof. Ernst Schmidt as editor of the Pharmaceutical Archives, and also became his successor at the University of Marburg, where he carried on most of the work that contributed to his great name in research. After the death of his predecessor he revised and re-edited the several books of which Professor Schmidt was author. Possibly his outstanding work was on certain alkaloids glucosides; he explained the conversion of hyoscyamine into atropine and of *d*-scopolamine into *l*-scopolamine.

Prof. Leon Guignard contributed largely to research by his investigations of diastases, glucosides and principles which furnish cyanhydric acid in various plants, and the constituents of the cruciferous and other families. To him is also ascribed much knowledge relative to mucilage secretion that exists in the Laminaires and of the oleoresins of the Copaifera and of other leguminous plants, and also valuable studies on the origin and structure of seeds of a large number of plant families. In earlier years he attained distinction as hospital pharmacist. Many honors came to him on account of his achievements, by presentations of degrees and medals of the highest order. He was professor of botany at the University of Lyons and, later, in the Pharmacy School of Paris.

Former President Joseph L. Lemberger probably has the distinction of longer membership in the American Pharmaceutical Association than any other member, nearly seventy years. During most of these years he was active in its promotions and a frequent contributor to its sections. The late John F. Hancock said of him, "He is a man small in stature with a big soul. During his long membership he has contributed his activity, best thoughts and experience. His literary

contributions are worthy of perusal. The writer has never known him to intentionally misrepresent facts."

Caswell A. Mayo was one of a number of pharmaceutical journalists who presided over the American Pharmaceutical Association, and during the annual meetings of many years he added zest and interest and was untiring in his efforts for pharmacy and the association. He enjoyed the companionship of friends and was ever loyal. His editorial work continued over a period of forty years. Mr. Mayo did not attend the meeting in St. Louis. He was missed and received a message from his friends in attendance. In an appreciative reply he penned a poem, "The Years Pass On." It closed with these lines:

"I thank you for the message which you send
To one who's proud to reckon you as friend;
And only hope next year a kind fate
Shall let us meet again in that far State
All girt with seas and mountains, and whose lakes
A joyous summer playground makes.
But if we shall not meet; if the hand of Fate
Shall beckon one of us to pass beyond the gate
Of life; you will know your kindly thought
Of me in absence, has keen pleasure brought
To one left lonely by the passing years
Whose loneliness your friendly message cheers."

Few retail pharmacists have been so closely identified with pharmacy in its several divisions as former President George M. Beringer. He chose pharmacy for his life work as a youth and continued in the service until his passing, and during these years of active life he had been apprentice, pharmacy owner, educator, manufacturer and wholesaler, and was always ready to work for those engaged in the drug business, pharmacy, for the development of business in general, the municipality and the State and country. Careful in all of his engagements, he stood firmly for whatever he deemed right; there was never a question about his position.

At the time of his demise he was a member of the Committee on Publications of the A. Ph. A. He was a member of the Committee of Revision of the U. S. Pharmacopœia, 1910 and 1920, and of the Committee on National Formulary since 1908, in the work of which his comprehensive knowledge of pharmacy and allied sciences, and his critical judgment did much to advance the practicality of these standards.

Mr. Beringer was trained by Charles Bullock, and the latter by Daniel B. Smith, the first president of the A. Ph. A.; therein we can discern that influences impress the individual—early in life, like his predecessors, the deceased became a devotee of research. His contributions to scientific organizations and periodicals have been many and of great scientific and practical value, and his influence has been for great good to American pharmacy.

Honorary President Edward Mallinckrodt died during his term of office. With his brother he engaged in the manufacture of chemicals, after conclusion of studies in the Fresenius Laboratory at Wiesbaden, Germany. He was a lover of flowers and art, and interested in promotions to beautify his home city, and gave largely to institutions for the alleviation of suffering. A co-worker said of him:

> "He was a remarkable man, with the highest sense of honor, integrity and business ethics. In the manufacture of medical products his principle was to produce nothing but the best. One of his chief concerns in life was the advancement of science and education, and he did much to give young men opportunities for scientific training."

Samuel W. Fairchild was the founder of pharmacy scholarships in Great Britain and the United States. His activities outside of pharmacy indicate that he believed in being diligent and active in doing good. He was vice-president of the Sevilla Home for Children, incorporator of the Bronx Botanical Gardens; for his services during the war France made Mr. Fairchild a chevalier of the Legion of Honor; Belgium bestowed upon him the Cross of Officer of Leopold Second; Greece decorated him with the Golden Cross of the Royal Battalion of George First.

This report would become too extended if every one of our members who passed into the Great Beyond during the past year was sketched as those preceding. The purpose is not to single out these members for any other reason than that the association gave them special recognition; Mr. Fairchild is included among the foregoing because of the scholarship established by him. All of the deceased during the year are named in the following list. They were faithful members of the association; brief sketches have appeared in the JOURNAL, and we here pay them tribute. They dignified pharmacy and reflected credit by their cervice.

George M. Beringer, Camden, N. J.; Theodore Campbell, Philadelphia, Pa.; Harry W. Crooks, South Orange, N. J.; William D. Duncan, Ottawa, Ill.; A. Morris Earnshaw, East Greenwich, R. I.; Samuel W. Fairchild, New York City; John C. Falk, St. Louis, Mo.; John George Gadamer, Germany; Sir William S. Glyn-Jones, England; M. Leon Guignard, France; William A. Hall, Detroit, Mich.; Francis Hemm, St. Louis, Mo.; Charles H. Hitchcock, Brookline, Mass.; Joseph L. Lemberger, Lebanon, Pa.; James E. Lilly, Indianapolis, Ind.; George W. McDuff, New Orleans, La.; Edward Mallinckrodt, St. Louis, Mo.; Caswell A. Mayo, New York City; Edward Ludwig Pieck, Covington, Ky.; Edward Augustus Sayre, East Orange, N. J.; Christian Schertz, New Orleans, La.; George E. Schweinfurth, Brooklyn, N. Y.; Alexander W. Scott, Fort Collins, Colo.; Mrs. Mabel A. (Bauer) Stegmayer, New York City; Edgar D. Taylor, Richmond, Va.; John B. Thomas, Baltimore, Md.; James Vernor, Detroit, Mich.; John Crawford Wallace, New Castle, Pa.; Edward Waters Whiteside, Washington, D. C.

Recently "A Florentine Diary from 1450–1516," by Luca Landucci, has appeared in English translation. The diary was kept by the before-named apothecary, who lived in the stirring period of Savonarola's reforming crusade. As the book is the subject of an illustrated lecture before this section no further reference is made thereto.

A history of Plough Court has appeared. It gives an interesting account of the activities and lineage of Allen & Hanburys, Ltd., from 1715–1927.

The Society for the History of Pharmacy has published a number of illustrated booklets; that on Flückiger has been referred to, the other relates to apothecary apprentice introductory letters during 300 years.

Mrs. Whelpley's gift of Pharmacopœias was referred to last year. With these she presented a number of other books, nearly a complete set of volumes of Meyer Brothers' Druggist, bound volumes of the Council Letters from the beginning and almost complete up to a year or two ago. Mrs. Whelpley has also promised other books. Mrs. (Wanous) Stewart, of Minneapolis, has put aside some bound volumes of various pharmaceutical journals and P. Henry Utech also has set aside quite a number of volumes.

Dr. Joseph Jacobs has presented a gavel, made of the newel post in the home of Dr. Crawford W. Long, to the association.

Former President Dr. James H. Beal has presented his extensive reference library, part of which has been delivered. Having served him as a reference library and known to contain many valuable volumes and taking this into consideration with the fact that the weight was nearly four tons, an idea may be had of this donation. More volumes are coming later.

Professor Miner, of Chicago, has given a full set of the *Journals of the American Pharmaceutical Association.* To all of these donors grateful appreciation is expressed. We have been in correspondence with some of the older pharmacies and there is promise of donations from these sources of apparatus, utensils, etc.

The Historian has with him a book of prescriptions from the store of the "Father of American Pharmacy," William Procter, Jr., donated by Mrs. Whelpley. Also a photostat copy of leaves from a prescription book, from Apothecaries' Hall, New Haven, Conn., donated by Mr. Gessner. The latter are in a scrap-book prepared by the Historian. This book is shown to indicate in a way what the association has in photographs. The Historian has continued the collection as reported in past years. The high appreciative valuation placed on the collection of Dr. Edgar Fahs Smith by the University of Pennsylvania indicates what the association has as a nucleus.

The library and museum will be most interesting divisions of the headquarters building, and both of them will be of service to pharmacy, pharmacists, the drug industries, and related sciences and activities.

SCIENTIFIC AND TECHNICAL ABSTRACTS

ABSTRACTS OF PAPERS
Submitted (prior to August 1) to the

SCIENTIFIC SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

for the Sixty-seventh Annual Meeting, Portland, Maine, August 20–25, 1928

THE RACIAL DIFFERENCE OF THE MYDRIATIC ACTION OF EPHEDRINE, COCAINE AND EUPHTHALMINE

By K. K. CHEN, Baltimore

(This investigation has been aided by a grant from the American Pharmaceutical Association Research Fund.)

A 10 per cent. solution of ephedrine with the addition of a trace of homatrophine of euphthalmine uniformly produces mydriasis in Caucasians and is useful in ophthalmoscopic examination. Ephedrine is, however, much less certain as a mydriatic in Chinese and Negroes. Not infrequently does it fail to produce any dilatation of the pupil. It was also found that pseudo-ephedrine, synthetic ephedrine, cocaine and euphthalmine are much less powerful in dilating the pupil of the colored races.

BIO-ASSAY OF PREPARATIONS OF OVARIAN FOLLICULAR HORMONE

By E. P. BUGBEE and A. E. SIMOND, Detroit, Mich.

Preparations containing Ovarian Follicular Hormone are assayed for biological activity by injecting the solutions into a series of white rats from which the ovaries have been completely removed. Vaginal smears, taken from these rats, are stained and examined under the microscope to determine the types of cells present. Certain types of cells characterize the five stages of the œstrous cycles, or sexual cycles,

in rats. A smear showing the cells characteristic of stage 2 (œstrus) indicates that the rat is in heat or œstrus. The smallest dose which will cause typical œstrus in a rat is called a Rat Unit.

The Rat Unit was first proposed and defined by Dr. Edgar Allen and Dr. Edward A. Doisy in 1924.

In recognition of the fundamental work which Allen and Doisy did in gathering together the bits of information regarding the ovarian and placental extracts and adding their own observation that the ovarian follicular fluid would produce œstrus when injected into rats, it seems proper that the Rat Unit should be adopted as the standard of activity of preparations of the Ovarian Follicular Hormone.

RELATIVE SENSITIVITY OF CATS TO VARIOUS MYDRIATICS AND MIOTICS

By J. C. Munch and H. L. Bunn, Baltimore, Md.

In connection with an intensive study of the various factors affecting the results obtained in the "Cat-Eye" method of assay of mydriatics and miotics, the question arose whether there was a definite ratio of susceptibility of cats toward various active drugs. Accordingly a number of cats were tested with atropine, homatropine, ephedrine and with physostigmine and pilocarpine. Results to date indicate that a cat which is overly susceptible to one mydriatic or miotic shows an increased sensitivity to other members of the same family. The threshold concentrations reported by Munch in 1926 have been found to apply to about 90 per cent. of the ordinary run of laboratory animals. For accurate work, however, the threshold of a cat should be determined within 10 per cent. and rechecked from time to time.

THE TOXICITY OF THALLIUM SULPHATE

By J. C. Munch, Baltimore, Md.

An extensive review of the literature on the toxicity of various Thallium compounds showed that they were extremely toxic. Thallium acetate has been used in the production of alopecia in the treatment of alopecia areata and ringworm. It has been found that all

animals, with the possible exception of the guinea pig, will react to comparatively small doses of thallium by a direct loss in the hair of the scalp or body under the control of the autonomic nervous system. Hair not under the control of the autonomic nervous system is not affected.

Doses of 8 mgm. of thallium acetate per Kg. body weight have been employed. However, great care is necessary in the use of this drug, since doses one-half this size have frequently produced toxic actions. A number of cases of poisoning have been reported in the literature.

When incorporated in the rat food it was found that 25 mgms. of thallium (in the form of thallium sulphate) per Kg. body weight was the minimum lethal dose. Injected intravenously into rabbits, the minimum lethal dose was found to be of 25 mgm. of thallium per Kg. body weight.

Thallium is cumulative in action. No evidence of the development of tolerance was noted in animals. The most striking action of thallium is its effect in causing atrophy and loss of function of the various endocrine glands, most especially the testicles in the males and the ovaries in the females. Complete loss of spermatozoa and complete wasting of the testicles have been obtained following the administration of comparatively small doses.

Used under careful conditions, thallium is valuable as a rodenticide. It is apparently the most toxic substance recommended for this purpose.

MYDRIATIC POTENCY OF EPHEDRINE AND ITS SALTS

By J. C. Munch, Baltimore, Md.

Tests by the "Cat Eye" method of a number of different samples of Ephedrine Sulphate and Ephedrine Hydrochloride showed that the minimum effective concentration in terms of the base was 50,000 mgms. per liter. The minimum effective concentration of the Ephedrine base itself either extracted from the hydrochloride or from the sulphate was always found to be 2500 mgms. per liter. No ready explanation for the increased activity of the base has been found. A similar increase in potency has been obtained in measuring the local anesthetic action of Cocaine base as compared to Cocaine salts.

REPORT ON THE AVAILABILITY OF CERTAIN NEW BIOLOGICALS

By J. C. Peacock, Philadelphia

The abstract notes such practical considerations of some recently introduced biological products as those of note action, strength, style and size of container, method of administration and simply related aspects.

BOTANY AND PHARMACOGNOSY

AUSTRALIAN SANDALWOOD OIL COMPARED WITH THE OFFICIAL EAST INDIAN OIL

By Edward Swallow, Mount Vernon, N. Y.

As various statements have recently appeared in current drug journals published in England, and reproduced in American trade journals, the author has compiled information of the latest character, obtained from the very best and reliable sources in Australia, France and England, dealing with a special Australian sandalwood oil, obtained from *santalum spicatum,* produced in Western Australia.

This particular Australian sandalwood oil has been analyzed by the firm of Seil, Putt & Rusby, Inc., New York City, and the report shows that this oil contains 95 per cent. santalol content—more than the official requirements of the East Indian sandalwood oil, obtained from *santalum album.*

Undeniable medical evidence obtained in Australia, England, and France, shows that this particular sandalwood oil is equal in medicinal value to the official oil, and has greater tolerability.

The Australian sandalwood oil, of this kind, if recognized officially by inclusion in the U. S. P., is more economical for medicinal use than the Mysore oil.

MEDICINAL TREES OF THE UNITED STATES

By Ernest T. Stuhr, Corvallis, Oregon

The work presented by the author is a comprehensive investigation of all the trees of the United States which are now or may be of

medicinal value. The results tabulated should be of interest to pharmacists. This compilation has been prepared to meet a specific demand with the primary objective of making the material readily accessible to all interested. An effort has been made to present the material in the form of a loose-leaf encyclopædia. The author states that of the 1177 different trees that make up the forests of the United States as listed by George B. Sudworth, 137 are of special interest because of their medicinal virtues.

CHEMISTRY

THE CHEMISTRY OF THE AGRUMENS WITH SPECIAL REFERENCE TO THAT OF SWEET ORANGE PEEL

By M. B. Matlack and Edward Kremers, Madison, Wis.

Of special interest is the isolation of a phytosterolin which appears to be identical with the phytosterol-d-gluco-side prepared by Salway in 1913 and with the ipuranol of Power and Salway. It is accompanied by two phytosterols. Of fatty acids palmitic and stearic, also oleic, linolic and linolenic acids have been identified. Other substances have been isolated, some of which are still awaiting identification.

THE ACTION OF NITROSYL CHLORIDE ON 2,2,4-TRIMETHYL PENTANE

By P. A. Foote and Edward Kremers, Madison, Wis.

This new isooctane being available in quantity, it seemed desirable to study the action of nitrosyl chloride on this representative of the methane series. Because of the tertiary hydrogen atom, the secondary reactions in this case will naturally be different from those involved in the action of this reagent on the normal hydro-carbons.

The hydrolysis is, in small part of this heterocyclic isonitroso compound, indicated by the formation of a small amount of a volatile substance with a camphor-like odor and of hydroxylamine.

THE ACTION OF NITROSYL CHLORIDE ON PENTADECANE

By P. A. Foote and Edward Kremers, Madison, Wis.

The presence of n-pentadecane in Kaempferia Galanga L. was established by Van Romburgh. On account of its biochemical significance it seemed desirable to prove its normal character by chemical means. For this purpose the nitrosylchloride reaction seemed best suited. The preliminary work in this direction, however, has shown that the reaction is not as one-sided as hoped for.

For the hydrocarbon-containing oil the investigators are greatly indebted to the director of the Botanical Garden at Buitenzorg, Java. The isolated hydrocarbon revealed the same physical constants as those recorded by Van Romburgh. The reaction with nitrosylchloride, however, yielded appreciable amounts of chlorination products. Their formation is explained.

Because of the expense of n-pentadecane the further study of these reactions with n-heptane is contemplated.

ORGANIC ADDITION COMPOUNDS OF CALCIUM CHLORIDE AND CALCIUM IODIDE

By Frederick R. Greenbaum, Philadelphia, Pa.

The compounds prepared were additional compounds with urea and thiourea or their derivatives and they combine as long as both amino groups or at least one of the amino group are not substituted.

Starting out with the well-known pharmaceutical compound, calcium chloride-urea, called "Afenil," the following additional compounds were prepared:

Calcium chloride thiourea, calcium chloride hexamethyleneamine $CaCl_2$thiosinamine, $CaCl_2$urethane, $CaCl_2$antipyrine, $CaCl_2$monoacetylurea (acetylafenil) $CaCl_2$acetylthiourea, and $CaCl_2$monophenylurea. From the calcium iodide compounds the following were prepared: Calcium iodide urea, calcium iodide thiourea, CaI_2hexamethyleneamine, CaI_2thiosinamine, CaI_2urethane, CaI_2antipyrine, CaI_2monoacetylurea, CaI_2monoacetylthiourea, and CaI_2monophenylurea.

These additional compounds are stable, less hygroscopic than $CaCl_2$ and CaI_2, they possess a definite crystalline shape different

from the crystals of $CaCl_2$ and CaI_2. They are only formed, when $CaCl_2$ as well as CaI_2 and the organic compounds are readily soluble in the same solvent. These compounds were prepared for pharmaceutical purposes with the idea in mind of detoxifying the $CaCl_2$ and CaI_2 by the addition of these organic bases.

AN ACCURATE METHOD FOR OBSERVING THE MENISCUS OF LIQUIDS CONFINED IN SMALL TUBES

By J. T. Lloyd, Cincinnati, Ohio

As is well known, the refraction of a curved glass vessel may distort or totally obscure the vessel's contents. A familiar illustration is the apparent change in form of a goldfish as it swims from place to place in a curved aquarium. The smaller the vessel, the more pronounced the curvature and the greater the distortion.

For the same reason, unless some means of overcoming refraction is employed, it is difficult or quite impossible to accurately observe the form of the contents of a cylindrical test tube. The appearances of the surface film and meniscus between immiscible liquids are warped by the curvature of the glass. If the observer does not take the refractive power of the glass into consideration, serious error may result.

To overcome the refractive power of test tubes and make clear observation of their contents possible, it is the custom in our laboratory to submerge the tube in a square, wide-mouthed bottle of cedarwood oil of the same refractive index as the glass of the tube. Naturally a bottle with plain sides must be selected. By this method the sides of the tube are apparently practically obliterated and clear observation of the films is made possible.

PRELIMINARY STUDIES OF THE ROSENHEIM-DRUMMOND COLOR TESTS OF VITAMIN A IN COD LIVER OIL.

By E. C. Towle and E. C. Merrill, Boston, Mass.

The Rosenheim-Drummond Colorimetric Test for Vitamin A in Cod Liver Oil, published on pages 148-150 in the *Lancet* of January

21, 1928, makes no provision for temperature control using the antimony chloride method.

The authors have found that—

(1) The speed of reaction is influenced very materially by the temperature of the reaction mixture;

(2) the blue color formed by the antimony chloride addition may be very definitely controlled by depressing the temperature; for instance, reaction commences to fade at 30° C. within one minute, but at 2° C. maintains for over an hour's time;

(3) the reaction appears to consist of two stages—
(a) development of blue color,
(b) development of red color;

(4) the speed of reaction may be increased by addition of a small amount of alcohol;

(5) the blue color of reaction may be brought back after fading has taken place by addition of small quantities of distilled water.

The subject is worthy of further study with the opportunity of standardizing temperature control in order to assure a uniformity of results as well as to permit more accurate readings of the color by the Lovibond tintometer method.

MEDICAL AND PHARMACEUTICAL NOTES

TERM "ANTISEPTIC" EXPLAINED UNDER FEDERAL FOOD AND DRUGS ACT—An investigation has been made by the Food, Drug and Insecticide Administration of the United States Department of Agriculture of those drug products on the market which are described as antiseptics. In order to answer numerous inquiries from the trade as to the propriety under the Federal Food and Drugs Act of designating these articles "antiseptic," the administration has issued the following statement:

Current dictionaries give two meanings for the word "antiseptic." According to these authorities an antiseptic may either kill bacteria or prevent their growth. Products such as salves, ointments, and dressings, which remain in contact with the body for long periods of time,

may properly be designated as antiseptics if they inhibit the growth of bacteria. On the other hand, mouth washes, douches, gargles, and preparations of like nature, which are in contact with the body for but brief periods of time, and because of this cannot exert any inhibitory action, may properly be described as antiseptics only if they will destroy bacteria under the conditions of use; that is, in the dilutions recommended, and in a period of time comparable to that in which they would have an opportunity to act when used as directed.

THE COMPOSITION OF DENICOTINIZED TOBACCO—Denarcotized opium has long been known to the materia medica. Decaffeinated coffee has of late years become a familiar product. The thirty-second annual report of Connecticut Agricultural Experiment Station, which is charged with the control of food and drugs sold in the State, gives some valuable data concerning the commercial forms of denicotinized tobacco. The especial difficulty in valuing these products lies in the great differences in the nicotine content of the several brands of the leaf. Many analyses covering all the familiar brands using the leaf in its normal state are given, showing that the nicotine content ranges from 3.63 per cent. to 0.43 per cent. with an average of about 1.9 per cent. The denicotinized samples ranged from 2.74 per cent. to 0.74 per cent., with an average of 1.4 per cent.

From these results it appears that the denicotinized samples contain about 30 per cent. less of the alkaloid than is found in ordinary unprocessed tobaccos. If we assume 2 per cent. as a fair approximation of the average nicotine content (dry basis) of ordinary smoking tobacco, the analyses show that four of the treated samples contain more than the average and four less than half as much. For the remaining samples it is fair to conclude that from one-third to one-half of the nicotine has been removed.

The report concludes with following opinions:

None of the denicotinized tobaccos included in the investigation are sufficiently low in nicotine to warrant unrestricted indulgence on the part of those who suffer from the effects of the alkaloid.

It may be found possible to remove the alkaloid practically completely from the leaf, as in the case of coffee, but it is not sure that the leaf so treated will retain the qualities for which tobacco is prized.

Nicotine commonly exists in two forms in the leaf-free and as salts of organic acids. The harsh and irritating effects noted when

with some tobaccos are attributed to the free alkaloid, but the denicotinized products do not differ in any conspicuous degree from the untreated forms in this respect.

H. L.

"BOOTLEG" MALTED MILK—"Bootleg" or adulterated malted milk is being sold to the public by a number of small vendors in place of the genuine product of legitimate manufacturers, according to a statement made public today by the National Better Business Bureau, Inc. Although health authorities are co-operating with the bureau in an effort to stamp out this substitution, they are handicapped, the report reads, because the public is unaware of the facts and because of the reluctance of many persons to inform authorities of specific cases of adulteration. The bureau's statement follows:

> "According to complaints made to the National Better Business Bureau, considerable deception exists in the sale of malted milk. 'Bootleg' or adulterated malted milk is palmed off on the public by a number of small vendors who boldly display the advertising material of the well-known national brands. In actual practice, these merchants stock the adulterated skim milk products, the containers of which are carefully hidden from view when a drink is made.
>
> "The legitimate manufacturers of malted milk employ whole milk in their product, with the result that it has a butterfat content of not less than 7½ per cent. by volume, the standard set by the Federal authorities for malted milk. The substitution of dry skim milk for milk containing cream results in a product which has a negligible butterfat content, far below the standard prescribed by the Government.
>
> "Inasmuch as malted milk is frequently used as a health product because of its nutritive value, the bureau urges the public to make sure that they ask for and receive a malted milk product of known reliability.
>
> "An effective way to eliminate an unfair practice and a potentially harmful menace to the public health is to make it unprofitable for the sellers of such things as 'bootleg' malted milk. This can be accomplished by avoiding these products in favor of those of known reliability.
>
> "The National Better Business Bureau or any of the forty-six affiliated local Better Business Bureaus stand ready to investigate the sale of any 'bootleg' malted milk products that may be called to their attention. If you have had any such experiences, get in touch with the nearest bureau."

CONFUSION WORSE CONFOUNDED—It was said in the '70's of the last century in medical circles that the use of potassium chlorate in American medical practice (now fortunately almost abandoned) was due to a mistranslation from the German, the original article recommending "kalium chloratum," which is potassium chloride, but taken by the translator as meaning potassium chlorate, which latter would be in German "kalium chloricum." Whether this statement is or is not true, there are many instances in which erroneous translations have caused serious misleadings.

The prompting for this introduction is the confusion that has crept into the discussions as to the effects of baking powders using alum, generally in the form of sodium alum. With curious frequency, the parties engaged in this widespread and somewhat acrimonious dispute talk about the effects of "alum," when there is no alum in the material after the leavening has taken place. Baking powders are always made with a slight excess of carbonate and the whole of the aluminum salt is transformed into aluminum hydroxide. In an article recently published in *Science* (1928, 68, 161), being the issue for August 17, repeated statements are made that "alum" occurs in fruits, vegetables, and meats, whereas the statements should be that "aluminum" so occurs. There is no alum of any kind in the articles served at our tables. Alum is found in the ordinary kitchen only in the unchanged baking powder. One sentence from the article will serve to show the peculiar misuse of the term. "Analyses of agricultural products made by Langworthy and Austen in the Department of Agriculture show the quantities of alum in our agricultural food products to be extremely minute." The total amount of "alum" in these products would be correctly represented by "decimal nought."

H. L.

SUNLIGHT BENEFICIAL TO HEALTH, BUT EXTENSIVE SUNBURN SHOULD BE AVOIDED—Almost every new discovery in the scientific or medical field becomes a fad and is often carried to the extreme. Scientific workers have recently shown the necessity and importance of sunlight for the maintenance of the health of children and adults. The beneficial action of sunlight in the cure of certain diseases of children and adults has also been pointed out.

One of the things which has been advocated a great deal recently, and which has proven of much benefit for children, is the sun bath. These sun baths are healthful not only because the child receives the

beneficial direct rays of the sun, but also because of the fresh air which it is thus bound to receive regularly.

Scientists have shown that direct sunlight not only prevents rickets, but if given regularly, will ward off many of the illnesses which are common in children. Tuberculosis would suffer a sharp decline among children if all mothers gave this simple treatment to their children.

In giving sun baths to the children it is well to keep the following facts in mind:

1. Exposure to the sun must be gradual or else the child may receive a sunburn.

2. At first give the baby direct sunlight for about ten minutes; increase this bath from three to five minutes daily until he receives exposure one hour in the morning and one hour in the afternoon. This will vary, depending on how the skin reacts to the exposure.

3. Be sure that the exposure is carried on in some spot sheltered from the wind.

4. Sun baths may be given on enclosed porches or in the house, provided the sun can shine on the child unobstructed by glass.

5. Certain special kinds of glass have been devised which permit the passage of the majority of the beneficial rays of the sun. Such glass may be used if desired.

The above directions also apply to adults who should observe similar precautions and avoid prolonged or sudden exposure to sunlight, as injurious or even dangerous sunburn may result if the sunburn is extensive.

In case sunburn does occur, the following has been found to be useful:

Make a lotion as follows: Take one-half a pint of hot water and stir into it a level teaspoonful of boric acid powder; then add 20 drops of carbolic acid, and shake well. The solution should be dabbed on the inflamed skin with a small piece of cotton or sprayed with an atomizer. It should not be rubbed into the skin. It can be applied every half hour, if necessary. If no medicine is available, cold compresses will give relief to badly burned areas.

CANCER CONTROL BY BLOOD ALKALINITY IS NEW MEDICAL THEORY—Cancer is associated with and possibly controlled to a large

extent by the relative alkalinity of the blood. This discovery was revealed by Dr. Ellice McDonald, chairman of cancer research of the University of Pennsylvania, in an address given before a recent meeting of the American Chemical Society Institute at Evanston, Ill.

Dr. McDonald flatly rejects the germ theory of cancer. At the same time he discounts the idea that cancer cells are of some abnormal species foreign to the human body.

A cancer cell is simply an ordinary body cell which is compelled to live in the wrong liquid environment. The trouble in such liquid medium comes mainly from excess of alkali, coupled at the same time with a low content of calcium in the blood—two factors closely interrelated.

The much-disputed radium and X-ray treatments for cancer are successful, in a limited number of cases, mainly in so far as they reduce the alkalinity of the blood. Experiments have demonstrated an appreciable rise in hydrogen-ion concentration—that is relative quantity of acid in the blood—following irradiation. It is still not clearly demonstrated how or why the powerful rays should succeed or fail in a given case.

'Tis an ill wind that blows nobody good. People cursed with "acidosis" are found by Dr. McDonald to be practically immune from cancer. The blood of such individuals, who are usually of sedentary habits, may reach the figure of 7.2 on the biochemist's scale of acidity. A victim of cancer, however, would show a record of about 7.45. Simply expressed, the latter figure means nearly double the alkalinity (or half the acidity) of the value for the former case.

It is likely that families cursed with cancer are composed of persons sharing a family tendency to run low in bodily acid and high in alkali. It is accordingly quite unnecessary to suppose that the actual disease itself may be inherited. Only the tendency is passed on.

When a body cell finds itself in an abnormally alkaline environment it simply acts like a yeast cell. It grows. Its cell walls expand and become more permeable. It divides, and great increases in number and mass occur. As with yeast again, the addition of sufficient acid stops the irresponsible, wild growth of the cells.

Dr. McDonald's revelations, supported not only by his Philadelphia staff but also by the recent biochemical discoveries of Rene Reding of Cancer Centre, University of Brussels, have thrown a large part of cancer research into the hands of the chemists. Search for new substances capable of correcting abnormal alkalinity is now pro-

jected. It is probably not sufficient merely to administer doses of some common acid to a cancer patient. It will be necessary either to attack chemically the fundamental source of alkali, or to foster acid production; these may be one and the same thing. With this will be joined an investigation of new calcium salts suited to the maintenance of decreased alkalinity.—(*Science Service.*)

A New Test for Sugar in the Urine—An accurate, simple and rapid method of determining the per cent. of sugar in urine has been developed by Dr. A. G. Sheftel, of New York.

The method, which is new and original, employs a colorimetric scale which in addition to a qualitative test, reveals the exact quantity of sugar present.

This test was designed for the purpose of making a quantitative test for sugar in urine simple and economical, so that the general practitioner could apply it in his office, and the diabetic patient in his home, in order to adjust the diet and the amount of Insulin required.

The test is exceedingly simple. All that is necessary is to add the reagents and urine to the marks graduated on the test tubes and pipette; heat the mixture in boiling water for five minutes, shake well and compare with the color chart. It is the only quantitative test for sugar that can be made without an accurate chemical analysis and calculation.

This method was verified by hundreds of tests with polariscope and Benedict's original quantitative method. It gives a percentage of error of less than one-tenth per cent. in urine containing up to 2 per cent. sugar and of less than one-half per cent. in urine containing from 2 per cent. to 7 per cent. sugar. Such a degree of accuracy is more than adequate for practical purposes.

Further information on the Sheftel sugar test outfit may be obtained from the H. K. Mulford Company, Philadelphia, who are manufacturing and marketing the outfit.

NEWS ITEMS AND PERSONAL NOTES

DR. J. C. MUNCH JOINS SCIENTIFIC STAFF OF SHARP & DOHME —About fifteen months ago Dr. Paul S. Pittenger severed his connections with the company he had incorporated in Philadelphia and became director of the Pharmacological Research Laboratories of Sharp & Dohme.

His many friends will be pleased to learn that he has recently been promoted to the position of assistant to the general superintendent. He will devote his attention particularly to the management of production and the development and scientific control of new products.

Dr. J. C. Munch, who has been associated with and in charge of the Pharmacological Laboratory of the U. S. Bureau of Chemistry (called Food, Drug & Insecticide Administration since July 1, 1927), has succeeded Dr. Pittenger as Director of the Pharmacologic Research Laboratories.

Dr. Munch was born in Farmer City, Ill. He received the degree of B. S. in 1915 from Illinois Wesleyan University at Bloomington, Ill., and the degree of M. S. from the same institution in 1916. He was in charge of the analytical laboratory of that university for three years, directing the analysis of medicines, soils, fertilizers, toxicological analyses, etc.

After teaching toxicology, physiology and organic chemistry in the University of Louisville Medical School, Louisville, Ky., during the academic year of 1916–1917, he joined the Bureau of Chemistry in 1917.

Enlisting in the United States Army in 1918, he was commissioned in the Sanitary Corps and attached to the Seventh Division, Laboratory Center, at Dijon, France, and saw combat service with the Ninety-first Division in the Lys-Scheldt campaign. After the armistice he was transferred to the LeMans Embarcation Area, as the area chemist and toxicologist.

Returning to the United States in 1919, Dr. Munch studied the application of physical chemistry and statistical methods to various problems in connection with the enforcement of the Net Weight Amendment to the Federal Food and Drugs Act.

In 1921 he transferred to the Pharmacological Laboratory of the U. S. Bureau of Chemistry, where research has been conducted upon

the toxicity of arsenic, lead, zinc and other heavy metals, aliphatic alcohols, alkyl esters, dyes and food preservatives.

Exposure to nitric acid fumes while engaged in an intensive pharmacological and toxicological study of the effect of lead arsenate upon various animals caused a rather severe impairment to one lung and led to Dr. Munch's separation from the F. D. I. Administration. After spending several months in the Mohave Desert in Las Vegas, Nev., he has practically recovered his health.

ALBERT J. STAUDT RETIRES—One of the oldest drug salesmen in Philadelphia, both in age and service, retired August 31st when Albert J. Staudt, sixty-two, of 6340 Woodbine Avenue, ended thirty years of continuous service as Philadelphia representative of Parke, Davis & Company.

Mr. Staudt, a registered pharmacist, owned a drug store in Aurora, Ill., in 1898 when he joined Parke-Davis. He is widely known among pharmacists, being a member of the Philadelphia Drug Exchange. The good wishes of the JOURNAL are extended to Mr. Staudt.